JUN 16 1898

THE IRON TRADE REVIEW

VOLUME XXXI. CLEVELAND, O. JUNE 16, 1898. CHICAGO, ILL. NUMBER 24

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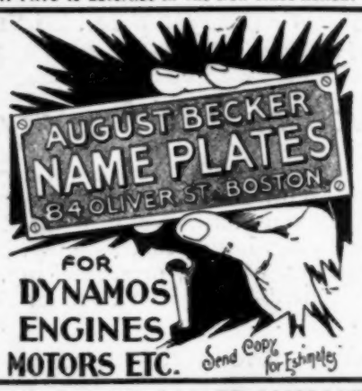

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On Page 24.

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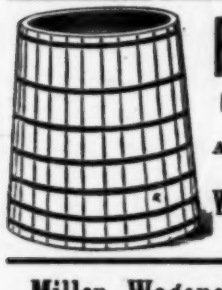

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THE IRON TRADE REVIEW

VOLUME XXXI. CLEVELAND, O. JUNE 16, 1898. CHICAGO, ILL. NUMBER 24

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

New buying has been less of a factor in the iron trade of the week than in several preceding it; but with the summer shut-down just ahead mills are pushing out a large product. Pig iron production was 9,000 tons a week less on June 1 than on May 1, and a modest reduction in stocks emphasized the movement toward more healthful conditions. But the market is heavy, in spite of consumption beyond the record, and the collapse of the partial agreement on Southern iron has not improved the feeling. History was repeated in this instance. A suspicion of cutting; then a quotation below the agreed level, made ostensibly for the purpose of uncovering cutting by others; failure to get the order, giving proof positive that some one else had cut deeper in the first instance; then an open fight. It was the rail pool over again. At the moment, buyers are not testing the market to any extent so that the effect of the rupture is not yet apparent. Quotations have gone below $7 on No. 2 iron and some gray forge has sold in the neighborhood of $6 at furnace. The largest company has announced that it will not meet prices reported in connection with recent sales. Naturally buyers are not rushing in at this juncture. Producers now find that the opportunity to get a fair price, afforded by the enormous demand from the West has gone by; and though some furnaces in Central territory have been able to get back certain Western trade that slipped from them while the low markets of 1896 and 1897 prevailed, little positive benefit has been realized by Southern furnaces from a situation that may be a long time duplicating itself. In the East pig iron remains flat, with less prospect than before that a concerted furnace movement will furnish a cure. In the Central West steel makers are not helping furnacemen to establish the $10 price on Bessemer. Purchases are made in a small way, lots in outside hands being still picked up at $9.75, and there are reports of deals in coke, basic iron, and steel that resemble some of the billet pool performances of 1896. The banking of furnaces, which is the really effective feature of the Bessemer agreement, is creating a better relation between supply and demand, and in the opinion of producers preparing for a condition in which the $10 price will be more readily maintained. There is a somewhat weaker feeling in steel billets, sheet bars and rods, that causes steel works to hold off on large purchases of iron. In all finished material prices have shown unusual evenness of late. The hoped-for advances have not come; and yet the regime of war taxes just ahead suggests to producers the possibility of getting a small margin for profit in addition to the additions that will come as prices of all commodities are scaled up. Some Western bar mills are getting into the condition of the plate mills, and are firmer. Sheet mills that have found demand backward through the spring months, are in better shape now, and on galvanized prices are firmer. Chicago has furnished some structural work in the past week and the mills are occupied to a larger extent by the aggregate of small orders than for a long time.

PITTSBURG.

OFFICE OF *The Iron Trade Review and Industrial World.*
808 TRADESMEN'S BUILDING, June 15.

Small orders are becoming as common in pig iron as in the past four months they have been in finished steel. The Bessemer pig iron agreement is in part responsible but not entirely so, for the combination is not taken so seriously as two months ago. Finished material markets show much irregularity. Plate and bar mills are overcrowded, while structural mills are with difficulty kept busy.

PIG IRON.—Hubbard Furnace No. 2 of the Andrews & Hitchcock Iron Co. joined the idle stacks in the week and Tod furnace at Youngstown was idle for a few days because of an accident. Business in pig iron is on a very moderate scale. Sales are being made weekly but the tonnage is small. Even the large users of Bessemer are buying oftener and in smaller quantities. Reports of sales at $10 are taken with some allowance and conservative opinions are that no iron is netting $10 to the furnace. Several lots of 2,000 and 3,000 tons are reported sold during the week at $9.75 valley for third quarter, but few sales include deliveries throughout the year. Gray forge is irregular, with sales reported closer to $9, Pittsburg, than a week ago. Foundry grades are inactive. We quote:

Bessemer, valley	$ 9.75 to $ 9.85
Bessemer, Pittsburg	10.40 to 10.50
No. 1 Foundry	10.40 to 10.50
No. 2 Foundry	10.00 to 10.25
No. 3 Foundry	9.50 to 9.75
Gray Forge, valley	8.75 to 8.90
Gray Forge, Pittsburg	9.15

STEEL.—The sales of sheet bars for the week have been large, the largest local manufacturer being included in the list of sellers. For the most part sales covered the last six months of the year. Prices are lower since the scramble for tonnage, $16.75 to $17, Pittsburg maker's mill, being quoted. Billets are weaker, if changed at all, and are quoted at $14.75 maker's mill, Wheeling and Pittsburg. Rods show a like tendency and prices below $20 are reported.

PIPES AND TUBES.—Mills quote six tens and 2½ per cent on small lots and six tens and 5 per cent on car load lots. The buying of merchant pipe is widely scattered and is for small sizes. So far, however, it is sufficient to keep mills moving. With most of the mills a shut down is probable after July 1. Base discounts are as follows: Butt weld, black, 57 per cent off; lap weld, black, 67 per cent off; butt weld, galvanized, 50 per cent off; lap weld, galvanized, 55 per cent off. Discounts on merchant boiler tubes are as follows: 2¼ inch and smaller, 72½ per cent off; 2½ inch and larger, 75 per cent off. The Pennsylvania Tube Works Co. are now making boiler tubes of all sizes.

PLATES.—The largest Pittsburg plate mill is full for seven weeks and has refused tonnage in the last few days for delivery in that time. The unusually heavy call for plates is in striking contrast with the slack sale of other shapes and is remarkable for the fact that it includes very little work calling for beams, channels and angles. With this exception the buying is general and includes almost all branches of plate consumption. Under the circumstances mills easily maintain 1.10c on ¼-inch and heavier tank. We quote shell at 1.15c, flange at 1.20c and fire box at 2c and upwards.

SPELTER.—Spelter is still firm at $4.25 to $4.30 for prime Western. A sale of 25 tons is reported at $4.30.

STRUCTURAL MATERIAL.—With such an active market in plates and bars, the very weak structural demand is the more noticeable. So light is the buying of beams, channels and angles that the two local mills are with difficulty kept busy. This situation is made the less favorable by the wide diversity in the shapes to be rolled, incident to a tonnage made up of small orders. The pool's prices are holding on the business placed: Beams and channels, 3 to 15 inches, 1.15c; 18 to 24 inches, 1.25c; tees, 1.20c; zees, 1.15c, and angles, 1.05c. Universal plates in connection with other shapes are selling at 1c; alone, at 1.10c.

SPIEGEL.—Spiegel is quoted at $23.50 and $24.

IRON AND STEEL SKELP.—We quote: Grooved iron skelp, 1.05c to 1.07½c; sheared iron skelp, 1.12½c to 1.15c; grooved steel skelp, 97½c to 1c; sheared steel skelp, 1.05c to 1.07½c.

SHEETS.—The sheet manufacturers are meeting in Pittsburg this week. On June 15, their wage committee meets the conference committee of the Amalgamated Association in the endeavor to arrange the 1898 scale of work The differences are insignificant and no very prolonged hitch is looked for. A general shut-down would not seriously inconvenience any of the mills using union labor, as the present order of running is very light. Some nearby mills are in need of tonnage and are making 1.85c and 1.90c on No. 28 in order to keep running. Galvanized sheets are much better off and are reasonably firm at 80 and 7½ per cent off.

BARS.—The larger agricultural orders are now placed and the mills are much firmer on prices, with so much tonnage assured. On prompt business, too, there are firmer prices and it is reported that no quotations less than 95c are made this week. The large local bar mill is full for two months on transient business and cannot take care of large orders. A peculiarity of the tonnage now coming in is the immense diversity of sizes and lengths called for. Mill operations are rendered very difficult in the large concerns where stocks are not carried. Barring the season agricultural orders, large requirements for steel bars are now very rare.

FERRO-MANGANESE.—The local producer of ferro asks $50, delivered, for 80 per cent domestic. Some foreign has sold here during the week at $49, delivered in Pittsburg.

OLD MATERIAL.—Old rails just now are in good demand, iron rails being the more active and being relatively stronger. Sales of 3,000 tons of iron rails are reported at $13 75, and 1,000 tons of steel rails at $10.25. Cast scrap is stronger again and is bringing $9 and $9.25, net. We quote other prices as follows: Wrought scrap, $10.50, net, valley; heavy melting stock, $10.50, gross; cast borings, $6, gross; wrought turnings, $7.50, gross; car wheels, $10.50, gross. No. 1 wrought, $11.50, net; charcoal, scrap, $10, gross; heavy melting stock, steel, $10.50, gross; billet and bloom ends, run of mill, $11; busheling scrap, $9.50, net; machine scrap, $9, gross.

CHICAGO.

OFFICE OF *The Iron Trade Review and Industrial World.*
1522 MONADNOCK BLOCK, June 15.

Large sales of material have been less frequent in the past week, but a good tonnage of small orders has been closed, and there is every prospect of a steady run of every-day business for some time. Buyers continue to take material fully as fast as they had contracted for it, and in many cases are having shipments made as rapidly as the furnaces can take care of them. Manufacturers in this district are all busy, with no sign of any diminution in the demand for their products. Agricultural trade is excellent, and the railroads are heavy buyers of most classes of material.

PIG IRON.—Considerable speculation is being indulged in as to the future course of prices of Southern irons. At present the market is undeniably weak and the small sales that are made are at figures considerably under the quotations fixed by the association. At the same time the Southern furnaces report a shortage in some grades of iron, and that they are making good sales throughout the country all the time. The local furnaces are practically out of the market for the present, having their order books filled for well along toward the end of the year. The only competition, consequently, is among the Southern furnaces themselves and to some extent from furnaces in Central territory. These latter, however, hardly expect to get a great deal of business in this direction. Some of their recent sales really signify only the recovery of trade they formerly had. It would seem an easy matter for the Southern furnaces to obtain a considerable advance on their products. It narrows down to the conclusion that the only reason higher prices cannot be obtained is to be found in the inability of the Southern furnaces to hold to any agreement when one is made. The consumers here, most of them, at least, would be willing to pay more for their iron, provided a uniform price could be made to their competitors. With the present weak condition of the iron market they find it almost impossible to get higher prices for their products, as their customers, being aware of the situation, refuse to believe that advances are necessary. Should iron advance, and the fact be made known, foundries would have reason for advancing the prices of castings, and would find it easier to do this. The market was not very active last week, sales being made only in comparatively small lots. No very large buyers are in the market at present, but a steady demand exists for small lots, and it is expected business of this character will keep the tonnage of each week at a steady level for some time. Quotations in Southern iron, as intimated above, are unsettled, but are about as given below. Other prices are unchanged.

Lake Sup. Charcoal	$11 50@13 00	South'n Coke No. 3	$ 9 75@10 00
Local Coke Fdy. No. 1	11 50@12 00	Southern No. 1 Soft	10 35@10 60
Local Coke Fdy. No. 2	11 00@11 50	Southern No. 2 Soft	10 00@10 25
Local Coke Fdy. No. 3	10 75@11 00	South'n Silveries	11 25@11 50
Local Scotch Fdy. No. 1	11 50@12 00	Jackson Co. Silveries	12 50@14 50
Local Scotch Fdy. No. 2	11 00@11 50	Ohio Strong Softeners	12 00@12 25
Local Scotch Fdy. No. 3	10 75@11 00	Alabama Car Wheel	14 00@16 00
South'n Coke No. 1	10 35@10 60	Malleable Bessemer	11 50@12 00
South'n Coke No. 2	10 10@10 35	Coke Bessemer	11 50@12 00

BARS.—The bulk of business closed last week was in small lots. One or two season's contracts were placed, none of them for large tonnages, but the total for the week was somewhat less than that of the previous week. The demand for small lots is good. The market is unchanged, although it is no firmer than it was a week ago. Quotations are made as follows: Common iron is quoted at 1.05c to 1.10c; guaranteed, 1.10c to 1.15c; soft steel bars, 1.15c to 1.20c.

RAILS AND TRACK SUPPLIES.—The local mills closed orders for about their week's product of light rails, and took some small orders for heavy sections. Quotations are as follows: Rails, $20 to $22.50, according to specifications; steel splice bars, 1.15c to 1.25c; track bolts, with square nuts, 1.80c to 1.90c; hexagon nuts, 1.90c to 2c; spikes, 1.50c to 1.60c.

BILLETS AND RODS.—Sales of either billets or rods were small last week. A sale of 1,500 tons of sheet bars was made by a Pittsburg mill to an Illinois tin plate mill, the price being something under $18.50, delivered. Billets are quoted at $16 to $16.50, and rods at $22.25 to $22.75.

CAR ORDERS.—The Illinois Central placed an order for 1,500 cars with the Haskell & Barker Car Co. Another Western road bought 1,000 cars from Pullman. Car material business was good, and included several quite large orders.

STRUCTURAL MATERIAL.—Business closed in the week included a contract for a new building for Montgomery Ward & Co., to be built on Michigan ave., taking 2,500 tons of material. This contract went to Geo. A. Fuller & Co. The bypass for the Drainage Canal was let to Griffiths & McDermott. This will take about 1,500 tons of material. Considerable track elevation work was also let in the week. New business to be placed soon includes the Van Ingen building taking 700 tons; the Ayer building, 1,500 tons, and another building, of which the details have not yet been announced, taking about 1,200 tons. General business has been excellent, and moderately large orders for immediate shipment are frequent. Quotations are as follows: Beams, 15-inch and under, 1.30c to 1.35c; 18, 20 and 24-inch, 1.40c to 1.45c; angles, 1.20c to 1.25c; plates, 1.15c to 1.20c; tees, 1.35c to 1.40c. Small lots from stock are quoted at ¼ to ½ cent higher.

PLATES.—The business placed in this market last week was not especially large, although it included one or two pretty fair orders. The demand continues good, and sales are expected to hold steady for some weeks. Prices are made as follows: Tank steel, 1.15c to 1.20c; flange steel, 1.20c to 1.40c; fire box steel, 1.85c to 5c.

SHEETS.—There continues to be a good demand for both black and galvanized sheets, and sales last week were very satisfactory to the dealers and mills. One or two quite large contracts were closed. No. 27 black sheets are quoted at

1.95c to 2.05c, and galvanized sheets at 80 and 10 and 2½ per cent off.

MERCHANT STEEL.—Several good season's contracts were placed last week, and general business was excellent. The mills are inclined to be firm in their views, and refuse to make concessions to secure the best business. Prices follow: Open-hearth spring, tire and machinery steel, 1.60c to 1.70c; smooth finished machinery steel, 1.60c to 1.65c; smooth finished tire, 1.50c to 1.60c; tool steel, 5.50c to 7.50c; specials, 11c and upwards

SCRAP.—The demand for scrap is still small and there does not appear to be much faith in the immediate future on the part of the dealers. Only a few small sales were made last week. Dealer's selling prices are as follows:

Old iron rails, gross,	$12 25@$12 50	Axles, net	$14 25@$14 75
Old steel rails, long, gr.	10 50@ 11 00	Cast borings, net	4 25@ 4 50
Old steel rails, short	8 75@ 9 00	Wrought turnings, net	6 00@ 6 50
Old wheels, gross	11 00@ 11 50	Axle turnings, net	7 00@ 7 25
Railroad forge, net	11 50@ 12 00	Mixed steel, gross	7 25@ 7 50
Dealer's forge, net	10 00@ 10 50	Stove plates, net	5 75@ 6 00
No. 1 mill, net	7 50@ 8 00	Heavy melting steel, gr.	8 25@ 8 50
Heavy cast, net	8 50@ 9 00	Old iron splice b., net.	12 75@ 13 00
Malleable cast, net	8 00@ 8 50		

CLEVELAND.

OFFICE OF *The Iron Trade Review and Industrial World*, 27 VINCENT ST., June 15.

The condition of the ore trade is far from encouraging to the vessel interest. The shipments through the Soo canal up to June 1 were 1,629,103 gross tons, or 835,000 gross tons in excess of last year's movement to the same date, and with the Escanaba increase the record of 1897 to June 1 is exceeded considerably over 1,000,000 tons. Yet there are many vessels without cargoes—vessels going to Lake Superior or already there, without any assurance of a down cargo. Lake Erie dock machinery is fully occupied unloading the ore that comes. The situation emphasizes thus early in the season the depressing effect of record-breaking cargoes, causing the freight market to settle down into a calm, with only the prospect of drifting along in this lifeless condition through the season. Little ore has sold recently. Some Mesabi transactions are under negotiation at low figures, physical condition being a very important consideration with furnacemen.

PIG IRON.—The arrangement between Bessemer furnacemen of the two valleys seems to be perfectly operative so far as restriction is concerned, but not, thus far, in the matter of price. The $10 quotation has been freely made without resulting business. The usual rumors of cuts are heard, but these are difficult to trace. Evasions similar to those in connection with the billet pool are mooted. At all events no $10 iron is reported sold the past week, but transactions at $9.75 valley have been made through dealers' hands—one of 2,500 tons and one of 3,000 tons. Sales at $10.40 Pittsburg mill, and one at $10.30, same delivery, are noted. The furnace-banking portion of the agreement seems its most effective feature. The restriction is absolute and no evasion is possible. To reduce supply is a positive method of bettering the market without a price agreement. In the present case a buying movement, reinforced by the reduction of stocks, would readily take care of the price question. Foundry iron moves steadily. Local operations are on a good scale and the daily melt of iron is larger than in several years. Furnaces are getting $9.50 valley furnace for No. 2 and some have their figure at $9.75. On No. 1 quotations range from $9.75 to $10.25. Sales of mill iron are reported close to $9, delivered at valley mill. Lake Superior charcoal is in steady demand at unchanged price. We quote f. o b. Cleveland:

Bessemer, second quarter	$10 65	Valley Scotch No. 1	$10 65@10 75
No. 1 Strong Foundry	10 40@10 65	Valley Scotch No. 2	10 15@10 40
No. 2 Strong Foundry	10 15@10 40	Gray Forge	9 25
No. 3 Foundry	9 65	Lake Superior Charcoal.	11 50

FINISHED MATERIAL.—Mills are running to their full capacity—those governed by the Amalgamated Association scale working to clean up orders before the summer shut-down, while steel mills are kept going by the accumulation of small business. From present indications, the shut-down will not be over two weeks in most cases. Recent heavy orders have filled up steel bar mills and the price is a trifle stronger on ordinary business. A 1,500-ton contract for Bessemer bars is up in this market. Some open-hearth stock, for bolt work, has been included in recent buying. The common quotation on steel and iron bars is 1c Cleveland, which is shaded in special competition. Bridge work has furnished further structural orders, Toledo works being particularly fortunate bidders on recent contracts. Local houses have word from sheet mills of a slight advance on galvanized, due to good demand coupled with a higher price for spelter. In black sheets, conditions differ. Within the past two weeks demand has sprung up in several directions, though previously some mills were complaining of the backwardness of business. We quote No. 27 at 1.95c to 2c Cleveland. Prices on structural material are maintained and angles are now generally sold on the 1.05c Pittsburg basis. No change in prices has been made by wire and nail mills, and local plants are run in part as for some weeks past. Smooth wire is $1.15 Cleveland, four-point galvanized, $1.70; wire nails, $1.30, carload lots.

OLD MATERIAL.—The market has shown practically no variation in the past six weeks. Old car wheels are scarce, and are quoted $11. Old iron rails have been in steady demand from valley mills and are sold delivered at $13.75. Old steel rails are delivered at mill at $10.25. We quote No. 1 wrought scrap at $11.25 to $11.50, delivered at valley mill; busheling scrap, $9; cast borings, $6; machine cast scrap, $8.25 to $8.50.

CINCINNATI.

June 14.

The market during the past week as far as Southern iron is concerned has been a decidedly uncertain quantity. The breaking of the association in Birmingham resulted in a scramble for business on the part of some of the furnaces and all kinds of prices were made, so that to-day it is almost impossible to state with certainty what is the actual market price for any particular grade. The largest of all the concerns in the Birmingham district announces that it has not entered this scramble and that it does not want business at the prices that some others have made. It is believed, in view of all the conditions, that the present state of affairs would be temporary. There has been a fair run of orders embracing every variety of iron, and inquiries continue quite as numerous as ever. Notwithstanding the enormous tonnage being handled, prices remain low and irregular, though many of the furnaces are heavily sold ahead on certain grades. We quote f. o. b. Cincinnati: Southern coke, No. 1 foundry, $9.50 to $9.75; No. 2, $9.25 to $9.50; No. 3, $9 to $9.25; No. 4 and G. F., $8.50 to $8.75; mottled, $8.50; No. 1 soft, $9.75; No. 2, $9.50; Hanging Rock charcoal, No. 1, $14.50 to $15.50; Tennessee charcoal, No. 1, $12.50 to $13; Jackson Co. silvery, No. 1, $12 to $12.50; standard Georgia car wheel, $14.25 to $15.

THE TIN PLATE MARKET.

The last two weeks have been disappointing to the trade generally, and very little business has been done, notwithstanding offers from the makers at lower prices for the last quarter of the year. The buyers generally seem to feel that there will be an over-production of tin plates after Sept. 1, and that the present low prices will be still further shaded. As yet sellers are unwilling to concede that plates can be sold any less than prices now offered, and as a result very little trading has been done. A number of large specifications covering deliveries up to Jan. 1 are on the market, but buyers and sellers are apparently some distance apart in their views. The market on roofing plates has been most unsatisfactory this entire season, probably because building operations have been on a much smaller scale than usual. We quote f. o. b. Indiana and Pittsburg districts, deliveries July to December, as follows:

CHARCOAL TINS.

	IC	IX
Calland Grade, tissue packed,	$4.00	$5.00
Allaway Grade,	3.40	4.30

COKE TINS.

IC, 108 lb. Basis weight,	$2.85
100 lb. " "	2.75
95 lb. " "	2.70
90 lb. " "	2.65
85 lb. " "	2.60
80 lb. " "	2.55

WORCESTER GRADE TERNES.

IC, 216 lb., 20 x 28	$5.80
200 lb. "	5.50
190 lb. "	5.40

The above prices represent a fair average of the market, though some business has been done over the last quarter of the year at 2½c to 5c less than figures here given.

THE IRON TRADE REVIEW

AND

INDUSTRIAL WORLD.

DEVOTED TO MACHINERY, METAL-WORKING AND FOUNDRY TRADES AND IRON AND STEEL MANUFACTURE.

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JUNE 16, 1898.

THE FOUNDRY MOVEMENT GAINING.

The American Foundrymen's Association is getting its bearings. In the two years that have elapsed since the Philadelphia convention, which was called with a view to securing a closer union of foundry proprietors, the way has opened up and some things are seen in a clearer light. The purpose in the minds of some, to organize at Philadelphia an association that should take in hand problems of prices, of wages, and of markets, and cure, or at least mitigate, some of the evils of unrestricted competition, was not carried out, because the way had not been paved for any such step. But the American Foundrymen's Association was formed; and while its announced purposes, namely, "the advancement of the interests of foundry operators, the collection of information connected with the foundry business, the interchange of experience and the encouragement of uniform customs and action among foundrymen," cover a wide field and might include the specific objects referred to above, in its actual operations the association has limited itself to the discussion of technical questions and the betterment of practice in the shop.

When at Detroit last year the defense movement, that at Philadelphia was only a vague and nebulous proposition, was agitated as a practical possibility, a committee took hold of the matter, formulated its plans and in due time took the proper initiative. The result is the National Founders' Association—connected in no way with the American Foundrymen's Association, and having for its specific object the elimination of friction from the relations of employers and employes, and in that same effort improving the relations of employers to each other, by doing away with unfair wage cutting. It is plain that the new organization would not have been possible, without the good work of the other in abolishing distrust and bringing the foundrymen of the country together on terms of friendliness for mutual advancement.

In thus starting the proprietors' organization on its way, the association has not deviated from its original lines; it has simply shown its capacity to act on a particular proposition in the most appropriate way and to give effect to proposals that without it would be without form and void. Strictly in line with its work, the association took up at its Detroit meeting last year, the scheme of apprenticeship indentures, which the Western Foundrymen's Association had so well developed, and with slight modifications, endorsed and promulgated it. The meeting just closed at Cincinnati has taken action in another very important line, in appointing a committee on standard specifications for testing cast iron. This step may be looked upon as a sign of large self-confidence, in view of the vast amount of discussion and laborious experimenting that has gone on in the past few years, without any very definite conclusion. But we judge there is no occasion for the hasty inference that the American Foundrymen's Association enters upon this important work without reckoning the size of the undertaking.

The significance of the Cincinnati action is that the foundrymen, who of all others have a stake in decisions as to the character of the material they shall be required to produce, now for the first time take a hand in the determination of the matter. The Bessemer steel manufacturers of the country, by associated effort three years ago, made themselves a factor in the determination of standard specifications for steel. Their continued cooperation insures them a voice in a matter in which they are interested equally with the engineer and the user of steel. In the same way the foundrymen, who see that the time is not far distant when they must work to specifications for cast iron, are taking steps to make themselves felt in the determination of the standards to which they must work. To be sure, standard specifications and methods for testing cast iron and specifications for the castings themselves are two different matters, but they are so closely related as to require to be treated together. And in conducting investigations to determine how test bars for various kinds of castings shall be made and of what form they shall be, the committee appointed at Cincinnati will of necessity go thoroughly into the exactions as to strength and as to chemical analysis, laid down for the material itself.

It is plain that if cast iron is to hold its place against steel, it can only do so by meeting approximately the same requirements that are made for steel. And the time may come when foundrymen who have been indifferent to these questions, as raised by the advocates of advanced practice, will be glad to co-operate with the latter in deciding what character of material they shall make.

In undertaking so important a work, the American Foundrymen's Association has taken a step of far-reaching import. In the very attempt, it has raised the foundry trade to a higher level; and if it makes an important contribution, as it can well make, to the international movement for standards of testing, it will more than fulfill the anticipations of its promoters.

ON June 1 the active coke and anthracite furnaces of the country exactly equaled the number

of idle stacks producing coke or coke and anthracite iron—170 in each column. The rated weekly capacity of the 170 active was 218,636 tons; of the 170 idle, 102,343 tons. The figures tell the story: only a small percentage of the idle 170 will operate again at to-day's prices. It is significant that the great Central district, including Chicago, that furnishes 145,000 tons a week, or two-thirds of the current product of all coke and coke and anthracite iron, contributes but 34 furnaces, or 20 per cent, to the column of idle stacks. Pittsburg district, with an active furnace capacity of 60,000 tons a week, or more than 3,000,000 tons a year, had but one furnace idle at the opening of the month.

Personal.

J. L. Gobeille, of the Gobeille Pattern Co., Cleveland, sails for Europe, July 2, for a three months' trip.

Julian Kennedy, the Pittsburg engineer, sailed for Russia last week. Mr Kennedy is consulting engineer for the Mariopol-Nicopol Mining and Metallurgical Co., of Mariopol, Russia.

J. H. Moore has been admitted to the firm of Preston & Co., Pittsburg and the firm name changed to Darr, Preston & Moore. The new firm will operate both in iron commission and in stocks.

H. C. Frick, chairman of the board of managers of the Carnegie Steel Co., Ltd., sails for Europe on Saturday, June 18.

James B. Oliver, of the Oliver Iron & Steel Co., Pittsburg, reads a paper on "The Manufacturer's Relation to the Jobber," at the annual convention of the Southern Hardware Jobbers' Association at Old Point Comfort, Va., this week.

H. P. Hall, one of the pioneer newspaper men of St. Paul, Minn., has purchased the St. Paul *Trade Journal* and has become its editor and manager. The *Trade Journal* has been in existence for a long time, and is recognized as the leading general commercial journal of the Northwest. With Mr. Hall in charge, the paper is in position to attain increasing prominence and success.

A. Tropenas, inventor of the Tropenas steel process, and Thos. Powell, C. E., of New York, have been in Cleveland the past week, meeting by appointment several persons interested in the manufacture of steel castings by the new process.

Lake Superior Charcoal Furnace in Ontario.

The Deseronto Iron Co., Ltd., of Deseronto, Ont., organized some months ago by Canadian capitalists, associated with representatives of the Lake Superior charcoal iron industry, expects to be making charcoal iron at Deseronto about Sept. 15. The company has bought the Union Furnace at Detroit and will transfer its engines and stoves to Deseronto. The McMyler Mfg. Co., of Cleveland, is furnishing hoisting apparatus and the Peninsular Engineering Co., of Detroit, has the contract for a bridge. The stack is 61 x 14 feet. Lake Superior ores will be used and the product will be the same irons produced heretofore by Union and Gaylord furnaces. With the bonus of $2 a ton guaranteed to Canadian iron and the cheap charcoal obtained through identified lumber interests, the new company has a moderately profitable proposition. The Canadian market is now buying from 6,000 to 8,000 tons a year of Lake Superior charcoal iron, which the new furnace will probably displace in addition to its other trade. The Deseronto Iron Co., Ltd., has a capital of $99,900, of which $75,000 is subscribed. The officers are: E. W. Rathbun, president; Wm. Gerhauser, vice-president and general manager; F. S. Rathbun, treasurer; F. A. Goodrich, secretary.

The Detroit Copper & Brass Rolling Mills have had plans prepared for important additions to their plant. They include a new foundry, 74 x 150 feet in size and one story high, an addition to the main building, on the south side, 76 x 130 feet in size, an addition to the carpenter shop 36 x 60 feet, and a wire mill 36 x 60 feet. All these buildings are to be of brick; cost about $13,500.

CHANGES IN THE AMALGAMATED SCALE.

(Special Telegram.)

PITTSBURG, June 15.—It is likely that outside of the tin plate scale the Amalgamated Association's wage schedules will not require any extended conference for adjustment. The conference committee of the association is in session to-day with the wage committee of the sheet manufacturers. An early settlement seems likely now. The puddling scale conference will be held on Thursday.

The changes in the scales, apart from the tin plate scale, are as below. The puddling rate is left at $1, and the base of last year is retained. Under the boiling scale, in the foot-notes, in Section 1, the words "and it is understood that two weeks' work shall be averaged," are added. Section 16 is changed to read as follows: "Five heats shall constitute a day's work on double turn, six heats single turn, and in mills working three turns five heats shall constitute a day's work."

Another section has been added to this scale which reads: "Pipe scrap over four inches in diameter and heavy boiler plate shall be cut from four to six inches in length before charging."

The muck or puddling mill scale stands as it was, and the only change in the scrapping and busheling scale is the addition of a section to the notes, which reads: "When mixed material is worked, which is not provided for in the scale, the mean price between the prices of the material used shall be paid, the proportion not to go below one-third."

The knobbling scale remains intact, and also that for heating slabs and shingling.

To the scale for bar and 12-inch mills is added Section 9, reading: "All crop ends used as billets, and all flats used for top and bottom purposes, or used in any way in competition with good bars, 10 per cent below scale prices shall be paid."

To the scale for guide, 10-inch, hoop and cotton tie mills is added foot-note No. 13, as follows: "Whenever crop ends are used for a finished product or used as billets, 10 per cent below the scale prices shall be paid."

The next change is in the fifth foot-note under the sheet mill scale. This note now reads: "Twenty per cent added for changed iron and steel and for 15, 16 and 17 gauges, worked in single sheets." The portion after the word "steel" is new.

Section 12 of the sheet mill hands' scale is changed to read: "Twelve pairs of 140 inches long up to 150 inches long of sheet iron, and 10 pairs of over 150 inches long, to be the equivalent of 15 pairs of shorter lengths, and when working fire-bed 12 pairs of 144 inches long or over shall be equivalent to 15 pairs of shorter lengths. Single iron, or iron worked in pairs, to be at the same ratio."

Are Labor Unions Illegal Under Anti-Trust Laws?

President Shaffer, of the Amalgamated Association of Iron and Steel Workers, has written Secretary Bishop, of the Ohio State Board of Arbitration, asking if the new Ohio anti-trust act could be construed to make combinations of labor for the avowed purposes of maintaining a certain scale of wages, violations of the law. Secretary Bishop referred the letter to Attorney General Monnett, who said that only a construction on the law from the Supreme Court could give it a proper interpretation. He anticipated that it would have to be tested in the courts. He was inclined to believe that the courts would not hold that the word commodities, as used in the act, was meant to include labor, although he was perfectly aware that in scientific books the word did include labor. He assured Secretary Bishop that it was not the intention of the makers of the law—Mr. Monnett is the author of it—to strike at union labor organizations and yet they were afraid to make the specific exception lest that exception should make the law invalid.

AT Buchanan, Mich., the machinery of the Michigan Cutlery Co.'s factory is being packed for removal to Fremont, O.

THE Shelby Tube Co., Greenville, Pa., contemplates adding $150,000 improvements to its plant in the near future. New and improved machinery will be placed.

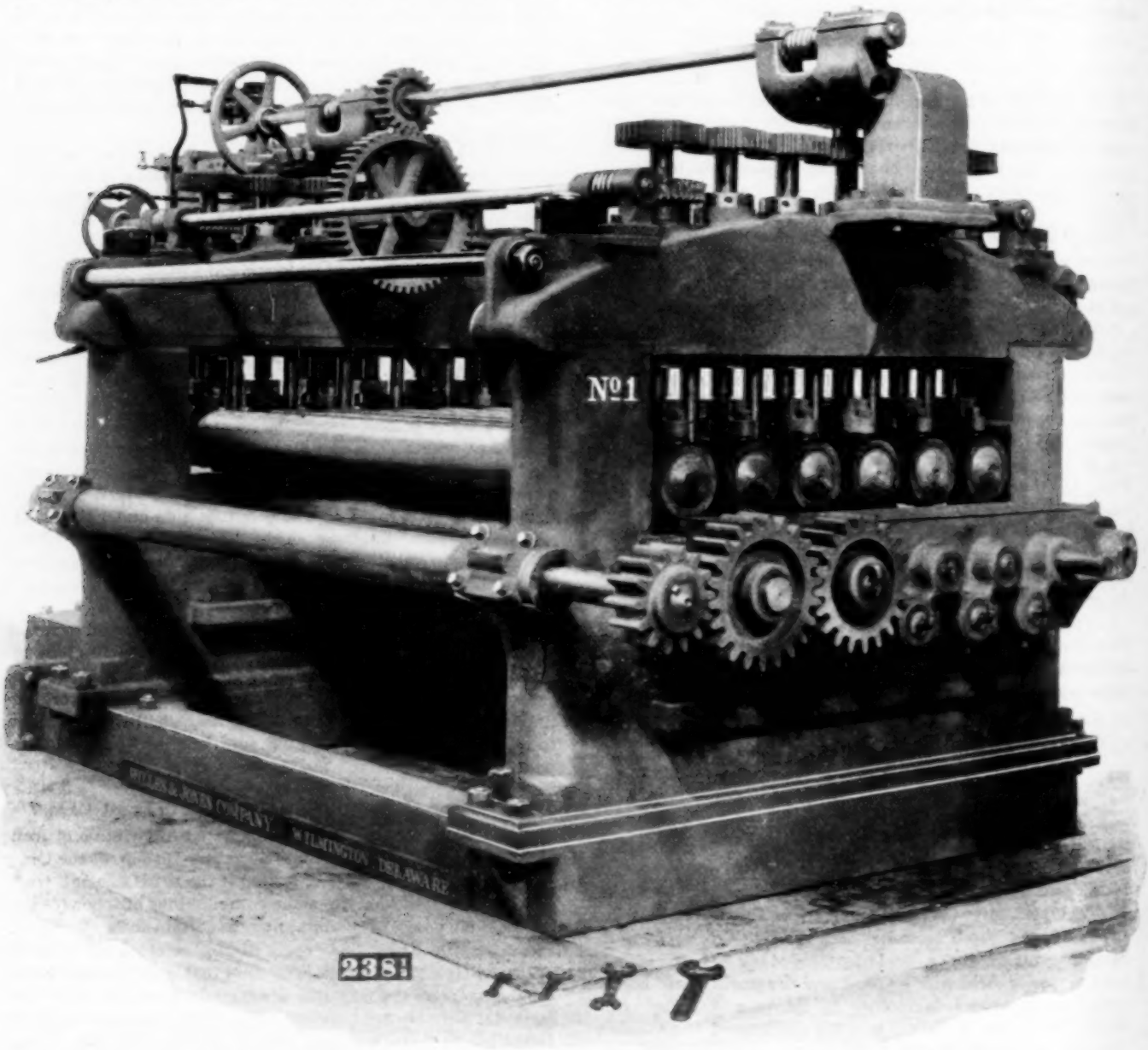
THE National Association of Credit Men—an increasingly influential organization—meets in Detroit, June 22, 23 and 24.

MILL STRAIGHTENING ROLLS.

A new type of straightening rolls, intended for straightening hot plates as they come from the main rolls, is shown in the illustration. The manufacturers are the Hilles & Jones Co., Wilmington, Del. Several features are provided which adapt this machine to the work of large plate mills and it has been installed already in a number of important plants. The rolls are driven by a separate pair of reversing engines which are mounted on the bed plate bolted to the main foundation plate supporting the housings. The rolls are 11 in number, of high carbon steel, and on the tool illustrated they are 8 inches in diameter and 80 inches between housings. These sizes can be varied to suit special requirements. The boxes which carry both the bottom and top rolls are of cast steel with brass bushings. The top rolls raise and lower either by hand or power. When used with power there is a friction clutch, which can be thrown in to operate them from the engines. The upper shaft on which the small hand wheel is placed raises and lowers all six of the rolls at both ends at the same time, while each outside top roll has independent vertical adjustment from a separate shaft and worm wheel.

The rolls are placed alternately so that there is a corrugating action on the plate as it passes through. This removes buckles in hot plates and improves greatly the output of the mill. For cold work a special design of machine is provided, on which there is a pinching roll to stretch the edges or middle of the plate. This is very desirable for bridge and ship work, but as the plates which are handled by the type of machine illustrated are hot this arrangement is not required.

Another special feature is the use of large caps over the roll housing. By the removal of these caps the rolls can be taken out without disturbing the housings from either foundation plate. The lower rolls are extended through on the back housing end and have bearings to take the thrust of the pinions which convey the motion between them. This also provides a method for driving the feed roll which is shown on the side of the housings. Arrangement is also made for a feed roll on the other side if it is desirable to have this. The pinions on the ends of the rolls and idlers connecting them are of cast steel, as are a large number of other pieces. The bed plate is of box form throughout, providing good surface to rest on the foundation. Bearings are large and well supported and the machine is intended for severe mill duty. These machines are constructed for driving either by belt, separate reversing engines or motor with reversing rheostat. In each case the whole machine is complete on one foundation and occupies comparatively little floor space.



MILL STRAIGHTENING ROLLS, MANUFACTURED BY HILLES & JONES CO., WILMINGTON, DEL.

An officer of the Cramp Ship & Engine Building Co. is thus quoted: "Give us three years, and America will take the ship building of the world; give us standard types and bunched orders and we will take the lead in two years." This week the Cramp yards are employing 3,518 men, against 2,119 a year ago, and it is estimated that within six months 5,000 men will be employed. What uniform types in manufacturing mean is well illustrated by the offer of the Cramps to the Government a few years ago to construct three warships of uniform type for the price of two of diversified type. The bid was rejected as "irregular," but it may not always be thus. It is figured that as against less than $4,000,000 the past year, the next year's business of the company will run $6,000,000, and over, exclusive of the $1,200,000 yet to be spent on the Alabama.

CINCINNATI CONVENTION ECHOES.

Able as his successors may be, it is doubtful if any who follow Francis Schumann as president of the American Foundrymen's Association, will have the opportunity to do as much as he has done to make its future secure. Tactful as a presiding officer, well fitted by a long engineering experience to take the initiative in technical discussions, and trained by a manufacturing career to see the practical bearing of matters under consideration, his services have been of the highest value to the association.

A party of 20 or more of the foundrymen accepted the invitation of the Niles Tool Works Co. to visit its plant at Hamilton, O., on Friday morning. Train was taken at 8:40 and after a thorough inspection of the works and an elegant luncheon served in the company's office, the party returned to Cincinnati in the afternoon.

The badge of the convention was full of patriotic suggestion. Twin flags unfurled were prominent on the body of the white ribbon used. The designation "Member" or "Guest" appeared above, and the pendant was a celluloid shield giving the association's name and time and place of the convention.

Engraved invitations to visit the plant of the S. Obermayer Co. came to many of the visitors through the mail and a number took the opportunity to inspect this important source of foundry equipment and supply.

The ability of the convention to dispatch business and to handle itself indicated that something had been gained by the tangles of the opening days at Philadelphia and Detroit.

More valuable even than listening to papers and discussions on the convention floor was the interchange of experience that followed the "turning on of the blast" in little groups of foundrymen in the convention hall, after adjournment, or in the hotel corridor, on the street car or the river excursion. Nothing in the round of the year gives as much for the outlay, in the testimony of those who have had the best opportunity to find out, as the chance to get and give the benefit of experience and observation in the foundry, afforded by these annual conventions.

Secretary Penton's alertness and his resourceful management of the interests of the association the past year merit fresh recognition. The programme showed the result of experience and an appreciation of the lines on which advances are being made.

The souvenir of the J. S. McCormick Co., Pittsburg, had on one side a half-tone of the group photograph taken at the Philadelphia convention in 1896 and on the other side a reproduction of the Detroit group of last year.

An interesting exhibit of the Avery molding machine was made by the manufacturers, the Whiting Foundry Equipment Co., of Harvey, Ill. It was shown in operation in the corridor adjoining the meeting room, and was at work on plow point molds. From 700 to 1,300 of these molds are said to have been made in a day from one machine. No flask is used. Each piece formed in a single operation consists of compacted sand, one side of which is the cope and on the other side the drag. These pieces are set close together on a floor frame composed of iron stringers, with the cope side of one piece against the drag side of the next. They are ready for pouring at any time and molding can be carried on simultaneously with the heat. The ramming is accomplisned by the single movement of one lever which finishes a complete mold. The pattern heads are forced together just the amount required to compact the sand properly.

Hot Metal for Open-Hearth Furnaces.

The Carnegie Steel Co., Ltd., has successfully introduced a new method in basic open-hearth steel manufacturing practice at the Homestead Steel Works by which hot metal is charged into the open-hearth furnace with only a small percentage of cold stock.

The first charge with hot metal was made June 1 with iron transported via the Union Railroad from the Duquesne blast furnaces, five miles distant. The operation of casting the metal at the Duquesne furnaces, transporting it in ladle cars, mixing, re-heating, re-casting in ladles and charging the open-hearth furnace, is done in about one hour. At Duquesne the metal is taken by 15-ton standard gauge ladle cars. Six or seven ladles are required for each cast at the blast furnace, and make up a train which is hauled by a standard Union Railroad locomotive to Homestead and run into the mixing house. Coke dust is used to cover the metal and retain the heat while in transit.

Each ladle is fitted with an electric tipping apparatus which turns the ladle and discharges its contents into an immense cask-shaped mixer of 250 tons capacity. The metal is run from the blast furnace, and into the mixer in 40 minutes, and when ready for the open-hearth furnace, the mixer is turned and casts the iron on the opposite side in 20-ton ladle cars which are moved to the No. 2 open-hearth furnaces. The iron is then run through a spout into the furnace in 10 minutes from the time it leaves the mixer.

Between 700 and 800 tons of iron will be transported daily from the Duquesne furnaces in this manner, and with the completion of the Union Railroad bridge across the Monongahela, hot metal will be shipped from the Edgar-Thomson furnace to Homestead.

CONDITION OF BLAST FURNACES OF U. S.*

June 1, 1898.

Location of Furnaces.	Coke and Anthracite					Charcoal.				
	Total No. of Stacks.	In Blast.		Out of Blast.		Total No. of Stacks.	In Blast.		Out of Blast.	
		Number.	Weekly capacity.	Number.	Weekly capacity.		Number.	Weekly capacity.	Number.	Weekly capacity.
New York	18	3	4125	15	8017	5	2	225	3	350
New Jersey	5	2	1603	3	1327	.....	.....	.....	.....	.....
Spiegel	3	2	425	1	100	.....	.....	.....	.....	.....
Pennsylvania:						13	0	0	13	750
Lehigh Valley	37	9	5704	28	12580	.....	.....	.....	.....	.....
Spiegel	1	0	0	1	100	.....	.....	.....	.....	.....
Schuylkill Valley	17	7	5067	10	5550	.....	.....	.....	.....	.....
Upper Susqu. Val.	5	2	1763	3	1780	.....	.....	.....	.....	.....
Lower Susqu. Val.	9	4	4910	5	2486	.....	.....	.....	.....	.....
Spiegel	1	1	475	0	0	.....	.....	.....	.....	.....
Lebanon Valley	12	7	4944	5	2923	.....	.....	.....	.....	.....
Pittsburgh	28	27	59745	1	2100	.....	.....	.....	.....	.....
Spiegel	2	2	983	0	0	.....	.....	.....	.....	.....
Shenango Valley	17	11	14527	6	3280	.....	.....	.....	.....	.....
Jun. and Con. Vals.	14	5	7477	9	4969	.....	.....	.....	.....	.....
Spiegel	1	1	675	0	0	.....	.....	.....	.....	.....
Youghiogheny Val.	3	0	0	3	3400	.....	.....	.....	.....	.....
Miscellaneous	5	2	2121	3	1789	.....	.....	.....	.....	.....
Maryland	5	2	3750	3	3870	4	0	0	4	574
Wheeling District	9	9	13053	0	0	.....	.....	.....	.....	.....
Ohio:						9	1	50	8	680
Mahoning Valley	11	8	12655	3	4396	.....	.....	.....	.....	.....
Central & Northern	11	10	14021	1	1475	.....	.....	.....	.....	.....
Hocking Valley	2	0	0	2	850	.....	.....	.....	.....	.....
Hanging Rock	12	4	1555	8	2159	.....	.....	.....	.....	.....
Indiana	1	0	0	1	130	.....	.....	.....	.....	.....
Illinois	16	13	24003	3	3500	.....	.....	.....	.....	.....
Spiegel	1	1	1179	0	0	.....	.....	.....	.....	.....
Minnesota	1	0	0	1	629	.....	.....	.....	.....	.....
Wisconsin	4	3	3115	1	770					
Missouri	3	1	850	2	700	1	1	335	0	0
Colorado	3	1	1450	2	3640	.....	.....	.....	.....	.....
Virginia	21	6	4339	15	9945	4	0	0	4	437
Kentucky	6	4	1802	2	1450	3	0	0	3	200
Alabama	39	18	18629	21	14150	12	2	745	10	2350
Mich. apd Wisconsin	.....	.....	.....	.....	.....	17	8	4378	9	3060
Tennessee	13	5	4791	8	3739	9	2	380	7	2310
Georgia	2	0	0	2	960	3	1	325	2	360
North Carolina	2	0	0	2	600	.....	.....	.....	.....	.....
New England	.....	.....	.....	.....	.....	11	2	160	9	858
Texas	.....	.....	.....	.....	.....	4	1	180	3	770
Utah	.....	.....	.....	.....	.....	1	0	0	1	175
Oregon	.....	.....	.....	.....	.....	1	0	0	1	275
Totals	340	170	218636	170	102343	97	20	6762	77	13049

SUMMARY.

Fuel.	In Blast.						Out of Blast.			
	Number.			Weekly Capacity.			Number.		Weekly Capacity.	
		Month Previous.	Year Previous.		Month Previous.	Year Previous.		Month Previous.		Month Previous.
Charcoal	20	18	15	6,762	6,571	3,321	77	79	13,049	13,209
Coke and Anthracite	170	176	131	218,636	227,592	165,059	170	164	102,343	99,116
Total	190	194	146	225,398	234,163	168,380	247	243	115,392	112,325

*Condensed from the *Iron Age*.

THE Riter-Conley Co., of Pittsburg, shipped 10 carloads of structural steel to Dublin, Ireland, last week. A second shipment will be made in two weeks and mechanics will be sent along to erect the power house for the Dublin Electric Tramway Co.

LAKE SUPERIOR IRON MINES.

Negotiations have been terminated the past week by which the Brier Hill Iron & Coal Co. and the Youngstown Steel Co., of Youngstown, O., acquire control of the Biwabik mine on the Mesabi range. The companies named have purchased the holdings of A. M. Byers, of Pittsburg, in the Biwabik Bessemer Iron Co. The remaining interest is held by Tod, Stambaugh & Co., of Cleveland, who will continue to have the agency for the sale of the Biwabik ore.

The showing made in the reports of the Duluth & Iron Range Railroad Co. and the Minnesota Iron Co. at their annual meeting in Duluth last week was the best in the history of the two companies. In addition to the officers of the two companies the party attending the meeting and making the annual tour of inspection included Marshall Field, of Chicago; Henry Hollister, J. B. Taylor and Mr. Hungerford, of New York, and Samuel Mather, of Pickands, Mather & Co. The only changes in the boards of directors of the two companies were the election of E. W. Winter, of St. Paul, to succeed James Belden, and of Geo. A. Brewster, of New York, to succeed his father, Benjamin Brewster, deceased.

The steamer Superior City took on a record-breaking cargo at Escanaba, Thursday, June 9, clearing with 6,756 gross tons of Old Mine Hematite from the Lake Superior Iron Co.'s mines. The cargo was taken to South Chicago and another record was broken when the vessel was unloaded in exactly 12 hours after tying up at the Illinois Steel Co.'s docks. The Superior City has 13 large hatches and the work of unloading was carried on from all of them, 11 men being used to a hatch.

The Auburn mine, on the Mesabi range, is being prepared for operation, after a year's shut-down. The royalty is said to be still 30c a ton. Some damage was done at the Auburn and Norman recently by heavy rains. At another Minnesota Iron Co. property, the Elba, the miners were drowned out by water.

The Lake Superior Iron Co., operated by the Lake Superior Consolidated Iron Mines, has closed down its Rust, Hull, Burt and Day properties in the Hibbing district. The effort to get a reduction of royalty has not been successful as yet. The Pillsbury, a fee mine, is still in operation.

The Ohio and Oliver properties have been put in shape again after recent rains that washed several thousand tons from the Ohio into the adjoining Oliver cut.

The Penobscot mine in the Hibbing district, Mesabi range, has closed down, with no date set for re-opening.

Iron Ore, Ishpeming, Mich., makes the following comment on the Mesabi situation: "With a very low selling price and high rate of rail freight the Mesabi producers have generally found it taxes their utmost skill to find a profit in the business of mining, the differential between the ores of that and other ranges and the difference in price of freighting more than offsetting the cheaper production from the deposits. This has given a greater impetus to the fight that is being waged for lower rates from those who control the railways. The owners of the roads are also owners of the biggest mines, and they have no desire to lessen the carrying rate to those who would be their competitors in the market. They probably figure that the independent owners would, with a lower price for carrying the ore to lake ports, make a still greater reduction in the market, and this the big fellows do not want. As common carriers they are operated under the laws of the State of Minnesota, and it has required much skill to secure legislation that is favorable to the plans of the railways. A strong lobby has attended the meetings of the legislature, and thus far the roads have been victorious. If the agitation would secure an agreement between the independent and other owners to regulate outputs it would be a good thing for the industry. The independent owner thinks he sees in the keeping up of freight rates a plan upon the part of the roads to force him out of business, as it virtually throws him out of the market. He believes the intention is to force him to sell to the railway companies, who already have control of the range. It is certainly not a very pleasing condition of things for the men who have no interest in the railways. On the other hand the railways can hardly be blamed for not inviting competition that would injure their business. They probably argue that there is more ore now being produced than the market can take care of and that the price leaves nothing for either the mine owner or miner in comparison to the money and effort directed in the enterprise. The drift is toward the centralization of the business, the control being placed in the hands of a few, and the progress in this direction has been most rapid of late. The Mesabi should take pains to keep prices up where there is a decent living in the business to those who own the mines as well as to those who are employed in them."

Low Prices for Cast Iron Pipe.

All records in Central Western pipe lettings were broken in Cleveland this week in the bids received for 5,840 tons of cast iron water pipe, to be used by the city in the current year. In February, on the previous advertisement, the Addyston Pipe & Steel Co.'s bid was $16.73 for pipe delivered on Cleveland streets. The Lake Shore Foundry, which has furnished most of Cleveland's water pipe for years, bid $17.45. The contract was let to the Addyston company by the board of control, but the City Council decided for a re-advertisement on the specious plea of "employment for home labor." The bids just submitted are as follows: Addyston Pipe & Steel Co, of Cincinnati, $14.93; Lake Shore Foundry Co., Cleveland, $15.10; American Pipe Co., Chattanooga, Tenn., $16.10. The aggregate bid of the Addyston Pipe & Steel Co. is $87,191.20 and that of the Lake Shore Foundry Co. $88,184. The award will be made on June 17. The recent litigation over the previous bids and the feeling aroused between the Cincinnati and Cleveland companies account for the exceedingly low prices. The newly formed American Pipe Co., of Chattanooga, made a bid ordinarily considered low for pipe put on street, but it was $1 a ton wide of the local bidder.

Depressed Condition of the Lake Freight Market.

It is time to quit. Some of the wooden vessels, even of the larger class, must be laid up. The ore business, heavy as it is, will not stand the pressure of tonnage diverted from the grain trade on account of a sudden ending of shipments from Chicago. Then, too, there is a decided scarcity of labor in the Lake Superior region, and the ore movement, although very heavy, is not as large as was expected. But the deep water, big ships and early opening of navigation are, after all, the factors that are acting against profitable freights. The freight movement to and from Lake Superior to June 1 is more than a million tons in excess of last year. Vessel owners who refused 60-cent ore and 20-cent coal some time ago would be pleased ot load up now with contracts based on these figures, but the great bulk of the ore and coal has been covered and those who have it are congratulating themselves. The manager of one of the coal concerns, who has about 400,000 tons covered by freight contracts at 20 cents a ton, says this is more coal than his firm had covered in three previous years. In the past they trusted largely to charters from day to day, but when they found big vessels this year ready to take coal for about the full season at 20 cents, they decided that the figure was the lowest that could be expected and then covered their sales fully. The same was the case with nearly all the big coal and ore concerns. The present situation is best explained by a contract made a few days ago. Three hundred thousand tons of ore was placed on the market on account of delay in completing certain new vessels now under way in one of the ship yards, and it is understood that this ore, to be moved from the head of the lakes, was covered at 50 cents for June, July and August, and 55 cents for September and October.—[Marine Review.

THE Wilmot & Hobbs Mfg. Co., of Bridgeport, Conn., is making extensive additions to its manufacturing plant, which consists of two large buildings. These are to be used as an engine and plating building and a machine or manufacturing building. The engine and plating building is about 60 ft. wide and 100 ft. long; two stories high, steel frame construction, with brick side walls and concrete floors. The machine building is about 80 ft. long and 135 ft. wide and three stories high. This building is of steel skeleton construction throughout. The floors are designed for heavy loads and are carried on corrugated iron arches supporting concrete filling. The aim in the design has been to get the most convenient structures possible and the maximum amount of light consistent with stability of structure and with economic construction. The designs were made by the Berlin Iron Bridge Co., of East Berlin, Conn., who furnish and erect the steel structural work.

AMERICAN FOUNDRYMEN'S ASSOCIATION.

The third convention of the American Foundrymen's Association at Cincinnati last week brought the association to the highest point in its history. In the character of its technical papers, in the evidence given that the past two years have shown the association some definite ends to strive for, and in the positive proof it furnished of the value of the organization to the whole foundry interest, the Cincinnati convention will go down as the best in foundry association history. Though Cincinnati has no conspicuous foundry development, the prominence of its pig iron interests and the co-operation of important foundry firms in tributary cities made possible a scale of entertainment that will be remembered with liveliest satisfaction by all who shared in it. Many who attended had been present also at the Philadelphia and Detroit conventions, and there was thus, to start with, a feeling of acquaintanceship and of familiarity with procedure that made the convention move more smoothly than heretofore. The appearance of so many faces seen at the previous conventions is proof that the association is demonstrating its value; those who know most of it appreciate it best. Below we give the names registered after the list published last week was made up:

Additional Members and Guests.

Members.—W. E. Sessions, Sessions Foundry Co., Bristol, Conn.; E. H. Putnam, Southern Agricultural Works, Atlanta, Ga.; C. S. Bell, S. C. Bell Co., Hillsboro, O.; Alva Carpenter, A. Carpenter & Son, Providence, R. I.; P. W. Gates, Gates Iron Works, Chicago; James R. Bowron, Tennessee Coal, Iron & Railroad Co., Chattanooga, Tenn.; A. I. Findley, *The Iron Trade Review*, Cleveland; A. J. Wentworth, Rogers, Brown & Co., Cincinnati; E. Robinson, Wells Light Mfg. Co., New York; I. C. Faulconer, Leland & Faulconer, Detroit; J. F. Dye, Newport (Ky.) Sand Bank Co.; C. A. Haertel, Waukesha (Wis.) Malleable Iron Co.; F. D. Carney, Ludwig, Loewe & Co., Berlin, Germany, recently with Pennsylvania Steel Co.; John B. Morris, John B. Morris Foundry Co., Cincinnati; D. B. Hyde and J. D. Rogers, Safety Emery Wheel Co., Springfield, O.; J. M. Warner, Rogers, Brown & Warner, Philadelphia; Charles Hoefinghoff, Hoefinghoff & Laue Foundry Co., Cincinnati; E. M. Drummond, Drummond Mfg. Co., Louisville, Ky.; Chas. Klein, Lane & Bodley Co., Cincinnati; N. P. Hyndman, Washington Coal & Coke Co., Pittsburg; S. S. Gaylord, Cleveland Facing Mill Co., Cleveland; Geo. R. Lombard, Lombard Iron Works, Augusta, Ga.; F. A. Goodrich, F. A. Goodrich & Co., Detroit; W. Stein, Whiting Foundry & Equipment Co., Harvey, Ill.; Thos. D. West, Thos. D. West Foundry Co., Sharpsville, Pa.; G. S. Lombard, Lombard Iron Works, Augusta, Ga.; W. C. Swift, with Henry E. Pridmore, Chicago; F. M. Bookwalter, James Leffel & Co., Springfield, Ill.; Henry Bond, American Radiator Co., Buffalo; C. E. Bell, C. S. Bell Co., Hillsboro, O.; S. S. Knight, Warder, Bushnell & Glessner Co., Springfield, O.; R. C. Augur, New York Air Brake Co., Watertown, N. Y.; J. R. Homer, Galion Foundry & Machine Co., Galion, O.; W. W. Cheney, S. Cheney & Son, Manlius, N. Y.; Wm. H. Switzer, Superior Foundry Co., Little Falls, N. Y.; Jas. H. Tuttle, S. Cheney & Son, Manlius, N. Y.; H. M. Lane, the Lane & Bodley Co., Cincinnati; G. W. DeSmet, Garden City Sand Co., Chicago; Jas. S. Stirling, Harlan & Hollingsworth Co., Wilmington, Del.; Fred. J. Bruner, J. D. Smith Foundry Supply Co., Cincinnati; M. C. Gauley, Connersville Blower Co., Connersville, Ind.; W. D. Patton, Rogers, Brown & Co., Cincinnati; A. P. Ford, Crane Co., Chicago; C. H. Schwab, Genesee Foundry Co., Genesee, N. Y.; F. E. Nulsen, Missiouri Malleable Iron Co., East St. Louis, Mo.; J. T. Wilkin, Connersville Blower Co., Connersville, Ind.; E. M. Gross, J. C. Reed, W. M. Singer and E. Pitcairn, Keystone Coal & Coke Co., Pittsburg; E. Edwards, General Electiric Co., Lynn, Mass.; Thos. H. Simpson and J. D. Brennan, Michigan Malleable Iron Co., Detroit; F. E. Gordon, Ohio Sand Co., Conneaut, O.; Geo. Mesta, Leechburg Foundry & Machine Co., Pittsburg.

Guests.—Rudolph Wegelin, Howard-Harrison Iron Co., Bessemer, Ala.; J. Stewart, Bradford Milling Co., Cincinnati; W. A. Hall, Niles Tool Works, Hamilton, O.; F. V. Knauss, Portsmouth Stove & Range Co., Portsmouth, O; Wm. Fischer, Globe Iron Works, Dayton, O.; Dave Smith, W. P. Callahan & Co., Dayton, O.; J. J. Bruce, Sam'l C. Tatum Co., Cincinnati; Louis F. Walter, with Thos. A. Mack, Cincinnati; A. F. Koons, Webster, Camp & Lane Machine Co., Akron, O.; W. A. Haven, Jas. L. Haven Malleable Iron Co., Cincinnati; C. J. Stewart, Marmet-Smith Coal & Coke Co., Cincinnati; R. A. Suit, Marmet-Smith Coal & Coke Co., Cincinnati; Louis G. Keck, Bickford Drill & Tool Co., Cincinnati; H. G. Byram, Cleveland Fencing Co., Indianapolis, Ind.; Wm. C. Doherty, Doherty Bros., Lowell, Mass.; William Cureton, C. D. Cooper & Co., Mt. Vernon, O.; T. H. Gartland, Gartland Foundry Co., Cleveland; W. P. Smith, Chris. Erhart, Cincinnati; E. F. Cook, Iron Castings Co., Cincinnati; R. Bahman, Blymyer Iron Works Co., Cincinnati; M. J. Pero, Fitchburg, Mass.; John A. Oberhelman, C. F. Thauwald & Co., Cincinnati; W. H. Orcutt, McIlwaine & Richards Co., Noblesville, Ind.; Andrew Macduff, Stillwell-Bierce-Smith-Vaile Co., P. E. Montanus, Springfield Machine Tool Co., Sprinfield, O.; Frank B. Ward, Michigan Brass & Iron Co., Detroit; H. M. Norris, Bickford Drill Co., Cincinnati; Geo. W. Getz, Chicago; C. M. Miller, Gartland Foundry Co., Cleveland; Chas. E. Hoyt, Lewis Institute, Chicago; A. G. Wilson, Hoefinghoff & Laue, Cincinnati; Theo. Ballman, Hoefinghoff & Laue, Cincinnati; Daniel McLaren, Addyston Pipe & Steel Works; S. E. Hilles, Samuel C. Tatum Co., Cincinnati; Monte L. Greene, the *Spokesman*, Cincinnati; A. L. Carleton, Hartford, Conn.; J. C. Alley, C. L. Pierson & Co., Boston; G. P. Smallman, Chicago; Chas. L. Miner, and Wm. R. Warner, Matthew Addy & Co., Cincinnati; John E. Donovan, Standard Iron Split Pulley Co., Cincinnati; Charles B. Erhart, Chris. Erhart Foundry & Machine Works, Cincinnati; A. S. Oberding, Eureka Foundry Co., Cincinnati; Geo. F. Crivel, F. B. Stevens, Detroit; S. P. Bacon, Cincinnati; G. S. Campbell, Campbell Printing Press Co., Plainfield, N. J.; J. Eckhardt, Eckhardt & Raible, Cincinnati; F. W. Bauer, chemist, Springfield, O.; J. D. Burgess, Cincinnati; Chas. L. Bauer, the Warden, Bushnell & Glessner Co., Springfield, O.; J. D. Leary, and Wm. Manley, Queen City Foundry; J. W. Foley, Jr., J. W. Foley & Co.; Col. Cornelius Cudle, Geo. M. Clark, Mitchell, Tranter Co., A. W. Osler, and Wm. Buchanan, Thos. Buchanan & Co., Cincinnati; John Dimling, Pittsburg; S. Bauer, Hill & Bauer, Cincinnati; S. P. Egan, J. A. Fay & Egan Co., Cincinnati; F. X. Black, J. Black & Clawson Co., Hamilton, O.; H. Mashima, Becket Paper Mill, Hamilton, O.; Thos. Buchanan, Thos. Buchanan & Co., Cincinnati; F. C. Schwoerer, Indianapolis Foundry Co., Indianapolis; C. E. Stewart, Cincinnati; L. Kahn, F. & L. Kahn & Bro., Hamilton, O.; H. Beeching, Pfau Mfg. Co., Cincinnati, Wm. N. Garpside, Diamond Clamp & Flask Co., Richmond, Ind.; S. P. Hostler, Winifred Coal Co., Chicago; Jos. Marsh, Cleveland Fence Co., Indianapolis, Ind.; J. R. Moore, Moorhead Bros. & Co., Inc., Pittsburg; J. H. Pepper, Philadelphia; Jas. H. Curan, J. H. Curan & Co., Cincinnati; Frank X. Lang, Newport Iron & Brass Foundry Co., Newport, Ky.; Charles Bailey, Reliance Steel Casting Co., Pittsburg; A. R. Ludlow, Springfield Malleable Iron Co., Springfield, O.; Chas. Lange, Buckeye Foundry Co., Cincinnati; D. T. Evans, Mt. Carbon Co., Powellton, W. Va.; Orville Simpson, Straub Machine Co., Cincinnati; Charles E. and J. E. Zimmerman, Eureka Foundry Co., Dayton, O.; R. E. Mehan, Monterey Foundry & Machine Co., Monterey, Mex.; A. J. Bauer, Hoefinghoff & Laue Foundry Co., F. A. Klaine, E. H. Huenfeld, F. A. Klaine; F. J. Spieker, Globe Foundry, Cincinnati; U. E Kanavel, Zanesville, O.; H. J. Gosiger, Eureka Foundry Co. Cincinnati; Otto Marmet and A. B. Trum, Marmet-Smith Coal & Coke Co., Cincinnati; B. M. Meilzeiner, S. Obermayer Co., Cincinnati; R. C. Nicholas, with Thos. A. Mack, Cincinnati; C. A. Treat, C. A. Treat Mfg. Co., Hannibal, Mo.; L. C. Rose, L. C. Rose & Co., Cincinnati; Geo. M. Hahn, Marmet-Smith Coal & Coke Co., Cincinnati; A. H. Tuechter, Bickford Drill & Tool Co., Cincinnati; F. A. Geier, Cincinnati Milling Machine Co., Cincinnati; J. H. Shaffer, Pittsburg Testing Laboratory, Pittsburg; J. J. Foley, and F. Johannigman, J. W. Foley & Co.; R. J. Kroger; Charles Buchanan, Thos. Buchanan & Co.; Lincoln Haney, the Globe Foundry Co., and Wm. W. Hearne, Matthew Addy & Co., Cincinnati; P. S. Macgowan, Minneapolis, Minn.; H. L. Crane, Loveland, O.; Richard W. Boland, Birmingham, Ala.; Thompson Atkinson, Marmet-Smith Coal & Coke Co., Cin-

cinnati; J. P. Metcalf, Erie (Pa.) Malleable Iron Co.; R. H. Frees, Walkersville Malleable Iron Co.; H. C. Hoefinghoff, Hoefinghoff & Laue, Cincinnati; W. C. Leland, Leland & Faulconer Co., Detroit; H. B. Parker, Albion Malleable Iron Co., Albion, Mich.; E. P. Bottsford, Pittsburg Malleable Iron Co., Pittsburg; Alexander Tropenas, Paris, France; Thomas Powell, Powell & Colne, New York; O. Tralverne, Tralverne Pump Co., Rockford, Ill.; Jas. Flockhart, Maher & Flockhart, Newark, N. J.; B. A. Wallingford, with Thos. A. Mack, Cincinnati; V. T. Palmer, Palmers & Demooy, Cleveland; Andrew Hawthorne, Dayton Coal & Iron Co., Cincinnati.

WEDNESDAY MORNING.

In our report of last week, reference was made to the addresses of Wednesday morning. Noteworthy among these was the one by Mr. James Bowron, first vice-president of the Tennessee Coal, Iron & Railroad Co., on the iron resources of the South. Mr. Bowron's presence, his ringing voice and his thorough familiarity with his subject in its technical and commercial aspects, made his address particularly attractive. To most of his audience the story of iron development in Alabama had many features of novelty and he was appreciatively listened to. The extent of pig iron production in Alabama was shown by the citation of a few figures, indicating the growth of the industry since the speaker came from England 21 years ago. Significant in this connection is a total export trade in Southern pig iron of 297,000 tons in the 18 months ending last January. The familiar fact of the close proximity of iron ore, coal measures and limestone was cited as the prime factor in Birmingham's command of distant markets, the speaker contrasting the distances traversed by various materials to the assembling point in other districts. A ball may be shot from a revolver at the top of a blast furnace in the Birmingham district, into ore mines, coal mines, coke ovens and limestone quarries. Referring to the present position of the strata of ore, coal and limestone in Alabama, the speaker used the fingers of both hands, pressed together horizontally at the tips. The upheaval at the point of contact left the strata tilted, with a valley between the two series that before had been one. Mr. Bowron showed that the operations of the past 20 years had merely made a scratch upon the face of the vast deposits of Alabama. Reliable computations based upon thorough exploration would indicate supplies of raw materials sufficient for 400 years. The question of outlet for the surplus product of the future was discussed. The low cost level which will be a permanent feature of Alabama iron production is a guarantee of ability to continue and enlarge the export trade. Iron delivered 20 years ago at Louisville at $17 a ton now sells there at $8 50; yet the same amount of ore and nearly as much coke is required for a ton of iron to-day as then. This scaling of prices means about $6,500,000 less a year to Alabama furnaces. But economies have been introduced that help to compensate for lower prices. The preliminary treatment of ore, the washing of coal, the increase in the product of a furnace—represented in some cases by a daily output of 45 tons per furnace in the early days, as against 250 tons now—indicate some of the advances in practice that have been made in the past 10 or 15 years. The chemical laboratory, too, has been playing an important part in improving the product and securing uniformity of results. The mistakes made in the establishment of the iron industry in the South were referred to—the effort to convert cornfields and cotton fields into town property at $500 to $1,000 a foot front by starting up a blast furnace; the inevitable receiverships, the ruinous prices for iron that resulted. The South now has the distinction of furnishing half the foundry pig iron produced in the South; but it is of little consequence to make a large record for production if the maker does not receive money enough to pay bills.

The field opened up to Southern iron producers by their ability to make iron well adapted to the production of basic steel, furnishes in the thought of the speaker the most promising element in the future of that section. Alabama is now making basic iron for steel works in various sections of the United States. Within 30 days papers have been signed insuring the erection of steel works in Birmingham that will take half the supply of basic iron now made. With steel manufactured from the cheapest raw materials in the world, with shipping ports close at hand, and low ocean freights on iron shipped abroad in connection with cotton, the South affords the largest advantages to industries manufacturing iron and steel products for export. The speaker referred to the establishment of steel making on a considerable scale in the South as likely to bring the end of abnormally low prices for Southern pig iron, due to the surplus now pressing upon the market. In connection with the large expansion of export trade certain to follow the termination of the war, the acquisition of outside territory, and with the construction of a large protecting fleet, the development of a merchant marine, and the building of the Panama canal, the speaker found a brilliant prospect for American industry and was particularly optimistic in his predictions for the iron industry of the South.

President Schumann's Address.

The annual address of the president indicated in brief what the association idea as developed in the past few years had done for the foundry trade. Before the organization of associations, the foundry business had little standing. There was jealousy and suspicion among foundrymen. The associations have brought members of the trade together, have broadened their views, begotten a spirit of progress and of pride in their work and established new and higher standards. Information has been diffused, valuable acquaintances formed, and a literature created that though as yet far from being what is desirable has laid the foundation for greater and greater advances. President Schumann recommended that the Journal of the association be enlarged and its field increased. The point was made that in the international struggle for industrial supremacy the country whose industrial sub-divisions possess superior knowledge and practice the most efficient methods, producing the best at the lowest cost, will be victor in the race. In Germany and Switzerland, where such rapid strides have been made in recent years in advancing industries, success has been due to the wise and comprehensive measures of the Government to reach perfection in the workshop and school. Concerning recent foundry progress the president said:

"While no extraordinary advances technically are to be noted for the past year, some are of sufficient importance to deserve mention: The subjection of green sand molds to the effects of a partial vacuum externally during the time of pouring the cast, is one. This has proved most effective in removing the gases generated, does away with the need of venting, no matter how hard the sand is rammed, and produces perfectly sound castings, free from all blowholes. Castings of the largest size are thus made. Another improvement is the use of power rammers for closing in around loam molds and general use. Yet another is the general use of compressed air as a motive force in operating cranes, travelers, pneumatic chipping tools, sand blast for cleaning castings, molding machines and so on. Not the least deserving mention is the rapid spread of knowledge in the application of chemical and physical methods in the mixture of irons, likewise the greater attention to methods for determining cost of product.

"Where in former years, indeed quite recently, the foundryman gave little attention to the character of his fuel, the amount of the blast in the cupola or the position of the charging door, he now carefully tests the coal or coke for the amount of carbon or percentage of sulphur. He also has his gauge-glass attached in a prominent position to the cupola and cannot get the charging door too high. He is also supplied with a microscope and carefully examines the molding sand and facing. In fact, science is making itself felt in the foundry as well as elsewhere.

"Aggressive and persistent competition has compelled those fortunate enough to possess the means, to apply them for the acquirement of labor saving devices, whether it be a molding machine, pneumatic chipping tool, power traveler, steam heat instead of the old-fashioned coal-eating stove, or gas as fuel in the core ovens. The successful foundry must possess modern devices and it is only a question of time when those that cannot must make way for those that can.

"Our association is in a satisfactory condition. Its influence, increasing with its growth in members, should continue to be exerted in the maintenance of amicable and close relations between employer and employee, to raise the standard of skill and knowledge of its craftsmen by energetically ad-

vocating the universal adoption of an apprenticeship system, heretofore recommended by committees, and to use all its power for the more general establishment of manual training or mechanics' trade schools throughout the country.

"It is also within the province of this association to formulate a code of practice which shall determine the responsibility for defective castings, whether due to improper manipulation by the foundryman or errors in the design and proportions of the piece in question. Faulty designs are often the cause of warped castings, 'shrink cracks' and initial stresses which it is impossible on the part of the foundryman to overcome, thus causing great annoyance and loss and often ending in expensive litigation. I would also recommend action that will lead to an early determination and adoption of some uniform system in the form and size of test pieces, the character of the test and also in the methods of obtaining samples of iron for chemical analysis."

Secretary's Report.

In part the report of Secretary Penton touched upon a topic treated in the president's address, the very evident advance made in the foundry world since the association idea took root being naturally a theme which leaders in the movement would dwell on in reviewing the work of the year. Secretary Penton observed that before the advent of foundrymen's associations it was rare to find a foundryman who knew anything about the technical side of his work, the information extant being generally confined to graduates of technical schools who had drifted into the foundry business. Now practical foundrymen everywhere, whose only schooling has been within the four walls of their shops have an opportunity to attend conventions like this one, in various parts of the country and are able to read papers and proceedings of foundrymen's associations in a number of trade journals. The result of this "higher education" is found in the constant demand for capable foundry foremen or superintendents, who are proficient in all that makes an up-to-date foundry manager. After referring further in general terms to the work accomplished, the secretary mentioned specifically the organization of the National Founders' Association as a fruit of the American Foundrymen's Association's efforts. But for the latter, the new organization would not have been possible, at least not in many years. This one achievement, in the minds of many, more than compensates for all that the association has cost. The secretary recommended that steps be taken to establish close relations between the American Foundrymen's Association and the various local associations.

The present membership is about 600. The receipts of the year, including the balance on hand one year ago, were $2,418.35; the expenses $2,003.56, leaving a treasury balance of $414.79. In the year 70 active and 10 associate members were added.

Appointment of Committees.

Under the head of new business, Thos. D. West referred to the work recently started under the auspices of the Pittsburg Foundrymen's Association, to secure for the use of furnace companies furnishing pig iron on analysis to the foundry trade, standardized drillings of cast iron. Consideration of the matter was postponed to the afternoon session.

Committees were announced by President Schumann, as follows: On Nomination of Officers—James S. Stirling, Harlan & Hollingsworth Co., Wilmington, Del.; T. H. Colvin, Colvin Foundry Co., Providence, R. I.; Dr. Richard Moldenke, McConway & Torley Co., Pittsburg; C. J. Wolff, L. Wolff Mfg. Co., Chicago; F. M. Bookwalter, James Leffel & Co., Springfield, O. On Changes in the Constitution—Geo. B. Buckingham, Arcade Malleable Iron Co., Worcester, Mass.; Wm. H. Switzer, Superior Furnace Co., Little Falls, N. Y.; Wm. Yagle, Wm. Yagle & Co., Pittsburg; W. A. Jones, W. A. Jones Foundry Co., Chicago; J. W. Treat, C. A. Treat Mfg. Co., Hannibal, Mo.

WEDNESDAY AFTERNOON.

The first paper of the afternoon was an excellent review of the apprenticeship question under the title, "The Molder of the Future and the Need of an Adequate Apprenticeship System," by P. W. Gates, president of the Gates Iron Works, Chicago. It is given in full on another page.

DISCUSSION.

Mr. Frank asked if the speaker placed a premium on foundry apprenticeship.

Mr. Gates: No, sir; all apprentices, in whatever department, are on the same basis.

Mr. Sessions: Do I understand that you turn all your apprentices out of the shop at the end of their term of indenture?

Mr. Gates: Always. Of course we do not compel any one to go; but we advise them to go elsewhere as a means of broadening their experience.

President Schumann referred to the scheme of apprenticeship, originally prepared by the Western Foundrymen's Association, and adopted at the Detroit meeting of the American Foundrymen's Association. He regretted that steps had not been taken for its general adoption. While abroad last year the speaker visited a European foundry, one of the cleanest he had ever seen, and the most systematically managed. The owner of the establishment was worth probably $15,000,000, yet his son, after having gone to the technical school, served a four years' apprenticeship in the foundry, working from 7 A. M. to 6 P. M.

In response to a question from Mr. Russell as to the disposition of apprentices to leave the shop at the end of their term, and whether they came back, Mr. Gates said that the system was young and only about a half dozen apprentices had been turned out under it. One young man had just gone out who previously had been in a manual training school. It is the expectation that a goodly proportion would get back to the shop in which they learned their trade.

A Standard System of Test Bars.

Dr. Richard Moldenke, of Pittsburg, read his paper as published in our last issue, entitled, "The Adoption of a Standard System of Test Bars for Cast Iron."

DISCUSSION.

Mr. Gates—Referring to the suggestion made, that the contracted portion of the bar be made with a core, how would it do to make the whole bar in core sand, or making the core with an aperture in it? Would there be any difference between that and a bar cast in dry sand?

Dr. Moldenke—I have not had opportunity yet to test bars cast in the way indicated. I merely offer this as a suggestion for experiment, and in the belief that it will give a bar whose strength will accurately represent the strength of the iron.

Mr. West—The suggestion of a core in the V-shaped portion of the section of the bar shown seems to be entirely original. It should prevent the erratic results seen in test bars cast in green sand. The chilling tendency of green sand has been frequently noticed, causing the carbon in the bar to exist more largely in the combined form.

Mr. Schumann—The subject is important. The time is coming rapidly when foundrymen will have to furnish material with tensile strength of 25,000 to 28,000 lbs. You make a half-inch bar for such work and get a strength of 26,000 lbs. per square inch. The inspector comes and makes a 1½-inch bar, which gives 18,000 lbs. You may lose hundreds of dollars on that single job. We must have something uniform. A friend of mine used a ½-inch bar as representative of castings he was making. Analysis showed the carbon in it to be all in the combined state; heaven only knows what became of the free carbon. Don't make your test bar too small, if you don't know what sort of a bar the inspector is going to make.

In answer to a question as to uniformity of casting temperature in making test bars, Dr. Moldenke said: I know of no way to fix the casting temperature. Iron cast hot in green sand is stronger than when cast in dry sand, on account of the combined carbon. I use a pyrometer to get the temperature. As to the size of the bar: If you have a casting 15 to 20 inches thick and cast a 2-inch bar from which the skin is turned off, you will get a bar practically representative of the casting. I am interested in seeing foundrymen protect themselves against what is coming. We shall all have to work to specifications some day.

Mr. Knight—In ordinary practice ½-inch and 1½-inch bars vary less than 200 lbs. The effect of chill in the ½-inch bar is so slight that it can scarcely be appreciated. A bar ½ inch square, 12 inches between supports, is more reliable than a

bar 1 x 2 inches, 24 inches between supports. I have tested a 1-inch square bar milled down to ½ inch, and then a 1½-inch round bar milled down to 1 inch. One showed 1,455 lbs. per square inch and the other 1,465 lbs.

Mr. C. L. Bauer.—We don't take a ½-inch or a 1-inch bar, but a bar .794 inch square. I have a record of four pairs of such bars, cast from the same iron. The transverse test of the first two showed 1,455 and 1,465 lbs., of the second pair, 1,425 and 1,440 lbs. Then a change was made in the mixture. The third pair ran 1,555 and 1,545 lbs.; the fourth pair, 1,605 and 1,550 lbs. In regard to the combined carbon and chilling iron: We have been able to test castings for hardness in a practical way. A test bar was cast with both ends against a yoke. We drilled holes in different parts of that bar. The hardest part was directly opposite the gate and the softest place at the ends in the chill.

On motion of Mr. Switzer, the chair was authorized to appoint a committee to consider the matter of a standard for test bars and to make a report with recommendations at the next annual meeting. This action was in accordance with one of the recommendations of Dr. Moldenke's paper. The other recommendation was also favorably acted upon and the Secretary was instructed to secure membership for the association in the International Society for the Unification of Methods of Testing Materials of Construction.

Action Concerning Standardized Drillings.

The chairman at this point introduced the matter called up at the morning session by Mr. West, as chairman of a committee of the Pittsburg Foundrymen's Association. Mr. West called on Dr. Moldenke, who drafted the memorial on behalf of the committee, to read it. The memorial is as follows:

"The undersigned, a committee appointed by the Pittsburg Foundrymen's Association, do respectfully memorialize the American Foundrymen's Association in convention, in behalf of a project to establish a central agency for the preparation and distribution of standardized drillings of cast iron. Ever since scientific methods of analysis have reached a point when their application to daily practice has become of manifest utility, the need has been felt by those most interested of positive assurance as to the reliability of the complicated processes and delicate manipulations upon which so much is made to depend. The series of comparative analyses recently made by 20 practicing chemists shows very strikingly that the uncertainty complained of is well founded. Managers and chemists have been interchanging samples for mutual examination for a long time, and indeed the whole system of instruction in our universities and schools is based upon standardized samples prepared by the professors in charge.

"A point seems to have been reached when our foundrymen, who are just beginning to give close attention to the practical aspects of chemical work, should be protected from annoyances and losses due to errors which might have been avoided. Incidentally this committee cordially endorses the recent appeal issued by Dr. Colby advocating stricter and better methods of sampling at the furnace, and hopes that the question will receive proper attention in due course. At the same time this committee feels that the first step should be in the direction of affording facilities to foundrymen, blast furnace managers, metallurgists, and chemists, to obtain correct results from samples standardized by the best talent of the land.

"To carry out this idea properly, this committee respectfully recommends to the American Foundrymen's Association the endorsement of a plan, as outlined below, to establish a central agency for the preparation and distribution of standardized drillings of cast iron. From preliminary work carried out with a view of placing such an agency on as high a plane as possible, and at the same time to make it self-supporting, it can be reported that the kind offer of Profs. Benjamin and Smith, of the Case School of Applied Science, to supervise the details of the work, is at once a guarantee for the reliability and excellence of the matreial to be sent out. Furthermore, the number of preliminary orders for such standardized samples already received in the few days that public attention has been directed to this matter, leaves no doubt as to the financial success of the undertaking. Once a sufficient number of orders are at hand the work, could be begun, and conducted on the lines of the greatest good in this direction for both foundry and furnace.

"Finally, should the American Foundrymen's Association endorse the project, we would respectfully recommend the appointment of a committee of seven members, who are to report at the next meeting. This committee should work through three sub-committees chosen from their number, as follows: A sub-committee on Finance, a sub-committee on Publicity and Promotion, a sub-committee on Methods and Results.

"All of which is respectfully submitted.

"THOS. D. WEST,
ISAAC W. FRANK,
RICHARD MOLDENKE.
Committee.

In connection with the memorial it was stated that Mr. West had already received 25 orders for drillings, so that the proposal promised in advance a successful outcome.

On motion the association endorsed the project and the chair was authorized to appoint a committee to carry out the recommendation of the memorial.

Need of Carefully Graded Pig Iron.

Thos. D. West's paper entitled "Necessity of Well Mixed Furnace Casts and Correct Reports of Analyses," which appears on other pages, was next read and discussed.

DISCUSSION.

Mr. Bond, of Buffalo, asked in what way Mr. West was in the habit of taking samples from a car load of pig iron, and in reply it was stated that six pigs were taken from the car and broken, and the drillings taken from the middle of the pig. Mr. Bond recited an instance in which the analysis of iron as made by the chemist of his firm showed a considerable difference from that of the card sent from the furnace. When the furnace company was asked how it had taken its drillings it developed that the pigs had been drilled from the side, and that sand, scale and all had gone into the sample.

Dr. Moldenke, in answer to a question: I take 10 pigs from a car and use drillings from the middle of the pig.

Mr. Bauer: It is our experience that results of analyses depend much on where you drill. Sulphur is different at the bottom, top and end of the pig. Some uniform method of taking drillings is certainly advisable.

Mr. Frank: At our Pittsburg meeting when this subject was discussed it appeared that there are wide differences in methods of taking drillings. At the Lucy Furnaces, where the iron is now cast in molds, free from sand, the samples at the furnace are taken from the big ladle from which the molds are poured. This molten sample is at once dropped into water, giving shot iron. Shot going through a 4-mesh sieve are used for the total carbon and silicon. It was found that this method gave a better approximation of the character of the metal than any drillings. I have thought that if a half dozen pigs taken from a car were broken and melted in a crucible a sample from the molten metal would be closely representative. The melted metal would show some change in silicon, yet the method if regularly followed would give close comparative results, closer than can be secured from drillings.

Drs. Moldenke, in connection with the discussion, took occasion to emphasize the importance of exactness in grading, sampling and analyzing iron. A letter which Mr. West had shown him, presented a case in current business, in which three cars of iron, on which the phosphorus limit was .100, had been rejected because the phosphorus in a sample from one ran .101, in another .104 and in the third .107. Thus a difference of 0.001 per cent of phosphorus had been made the basis of the rejection of an entire car of iron.

The paper of Chas. Vickers, entitled "A Talk on Brass Founding" (to be printed later) was read by Secretary Penton.

A paper by Chas. A. Bauer, of Springfield, O., on "A Test for Determining the Hardness of Cast Iron" was read by the writer's son, C. L. Bauer, also of the Warder, Bushnell & Glessner Co. The paper was given in full in our issue of last week. In the discussion, Mr. Bauer answered a number of questions as to the operations of the drill with which the tests were made—how it was kept "standardized," how its work in a given time is registered, how allowance was made for variations in the cutting efficiency of the drill, etc.

The paper of Guy R. Johnson was postponed to a later session, in the absence of the writer.

Wednesday evening brought an exhibition of the hospitable temper of the Cincinnati committee on entertainment. A smoker was given in the dining room of the hotel, and all the accompaniments of such an affair were provided in generous abundance. The 250 guests, it need not be said, proved thoroughly appreciative.

THURSDAY.

The second day of the convention brought with it not a little sultriness, like its predecessor. But Wednesday's rains, which interfered in no wise with the reading and discussion of papers, fortunately made no attempt to repeat themselves, and the outing on the river was all that could have been desired. A band led a procession of the delegates from the hotel to the river soon after 9 o'clock, and for the next few hours the panorama of Ohio and Kentucky hills afforded constant delight to the excursionists scattered over the three decks of the Island Queen. The plant of the Addyston Pipe & Steel Co., at Addyston, 10 miles down the river, was the objective point. Arrived about noon-time, a 10-minute walk brought the visitors to these important works, which seemed to be running at top-capacity. The great main building, of stone, was a veritable hive of industry. The hurrying to and fro of pony engines pulling ladles of molten metal or transporting heavy flasks and iron barrels or core bars, presented a scene more on the scale of Bessemer steel works practice than of ordinary foundry operation. The great cupola at the end of the building, with a capacity of 30 tons an hour, has evidently displaced the five smaller ones, ranged side by side close by, as none of them were in operation. The big scale of operations at every step of the work is constantly suggested to the on-looker. Core-making occupies one entire side of the building, the cores for the various sizes of pipe being made immediately opposite the respective pits in which the pipe are molded and cast. The making of these cores is the chief cost in connection with the preparation of the mold, in pipe making. The winding of the hay rope is followed by the coating of clay, then the drying, and in turn the finish coat of sand, sawdust and previously used core dirt, the coat of blacking and the drying of the finished cores. Coke fires are used in the core ovens and the cores are run into the ovens on rack carriages, carrying six to eight cores each.

The making of the molds and the rapidity with which the work was done attracted special attention. The generous equipment of hydraulic cranes standing at the centers of the pit circles permits of surprisingly quick work here, as in the pouring operations later on. Hydraulic ramming of the molds is practiced—an ingenious method that is a long step in advance of the hand ramming of the average pipe shop. Hydraulic cranes are employed, also, in the shaking out of the flasks, the finished pipe being rolled outside the plant on skids, awaiting their transfer to other buildings for the cleaning, chipping, tar bath and finally for hydraulic testing.

In the shop devoted to elbows, tees, crosses and special castings some large work was under way, including a 30 x 36-inch cross, for which the great core and cope, built up in brick, were about ready to be lowered into the casting pit.

It is not difficult to understand how, with its splendid equipment and its capacity of 375 tons of pipe a day, turned out with a minimum employment of hand labor, this establishment has been able to enter distant markets under the particularly severe competition of the past two years.

The return trip from Addyston began at 1:30, after the party had been photographed, grouped on the river bank alongside the boat. Luncheon was served as soon as the steamer got under way, and again the visitors were given occasion to speak in praise of their lavish entertainers.

THURSDAY EVENING.

Before the papers of the evening were taken up, I. W. Frank, of Pittsburg, took the floor and presented an invitation from the Pittsburg Foundrymen's Association and the Chamber of Commerce of Pittsburg, to hold the next convention in Pittsburg. Mr. Frank promised that everything possible would be done to make the association's stay in Pittsburg pleasant and he assured the delegates that they would be given such opportunities to see the typical industries of Pittsburg as would make them glad of their visit. The invitation, under the rules was referred to the executive committee.

Inspection of Castings.

The paper of E. H. Putnam, of Atlanta, under the above title, was read by the author. It will appear next week.

DISCUSSION.

Mr. Bell agreed with the writer that the losses from bad castings bore more heavily upon the shop than upon the molder; yet he believed the molder knows sooner than anybody else when his work is done wrong and is quick to correct mistakes without being called on to face the results of his bad work the morning after it is done. He thought it impracticable in most cases to have inspection as early as suggested, and believed it better to have some time intervene before reckoning with the molder for mishaps.

Mr. Frank recalled a case in which a mold was gated wrong six days in succession. Early inspection would have revealed the fault and saved money to the shop and the molder. He regarded inspection to be very important; in piece work it is very necessary, and in the operations of the jobbing foundry even more so.

Mr. Schumann referred to a case in which lighthouse and building columns were rejected, because certain lugs as cast were ⅛ inch out of the position indicated in the drawings. He made the point that inspection is often delayed too long, and an entire job jeopardized, whereas rigid inspection early in the progress of the work might have corrected the mistake.

Mr. West had found it advantageous where specifications were indefinite or the patterns furnished were not all that they should be, to submit some of the castings first made, to the buyer's inspection and get his approval before going ahead.

Micro-Structure of Iron and Steel.

Mr. S. S. Knight's paper on "The Micro-Structure of Iron and Steel" was read by the author. It showed large research and proved Mr. Knight to be a patient and painstaking investigator. Lantern slides were employed to exhibit the structure of steel under the microscope, the lecturer bringing out the value of microscopy in revealing ferrite and the various compounds of iron and carbon—cementite, pearlyte, martensite and troosite. The microscope gives the investigator clues to the causes of hardening in steel, to the heat treatment to which it has been subjected, and other factors, which have not been recognizable heretofore.

FRIDAY MORNING.

The meeting was called to order at 10 o'clock by President Schumann. A paper by H. M. Ramp, entitled "Trolley Systems, Their Value and Cost," was read by title. It will be published in a later issue.

Tropenas Steel Process.

A paper by Alexandre Tropenas, entitled "Notes on the Tropenas Steel Process," was read by Thomas Powell, of Powell & Colne, New York, who are agents for the process in the United States. Mr. Tropenas was present and the members were invited to ask him questions.

DISCUSSION.

Dr. Moldenke: What is the present percentage of loss in the Tropenas process?

Mr. Tropenas: The loss is about the same as in ordinary cupola practice. If we are making hard steel, we have quite a little more loss than in making soft steel. Our loss ranges from 4 to 6 per cent, but part of this is finally saved by the remelt of heads, gates, etc. Twenty-five per cent of our charge is made of our own scrap—gates, etc.

Mr. West: What grade of steel do you use to make dynamo castings?

Mr. Tropenas: It is practically pure iron, although called steel. It is very soft, nearly as soft as lead. Our castings are entirely free from blowholes. We add a little aluminum, which aids in getting this result. The process of casting is practically the same as in making iron castings.

Mr. Schumann: Many thoughtful foundrymen believe the time is not far distant when all castings will be of steel in place of iron.

Mr. Tropenas: With our process we make a metal, in many

cases, which cannot be called either steel or iron, although it is practically pure iron. We can blow up to 10 tons, but the system is especially adapted for making small charges—from one to two tons. Large or small charges can be made with equal economy, however.

Mr. West: How will castings made by the Tropenas process compare with cast iron or ordinary steel in regard to "peeling?"

Mr. Tropenas: We use a silica sand with a small per cent of alumina. When we get proper sand, castings are very smooth and clean and "peel" easily. We use the sand blast to clean castings.

Mr. West: What are the shrinkage and contraction of your castings?

Mr. Tropenas: They are about the same as in open-hearth castings.

Mr. West: Can the process be used in present foundry plants with the use of our present appliances?

Mr. Tropenas: Yes. There are some differences when we build new plants; but an old plant can be used with the addition of our process. We now have a plant in operation at the works of the Driggs-Seabury Gun Ammunition Co., at Derby, Conn., working on Government contracts. This plant can be seen in operation by anyone interested.

A paper by Guy R. Johnson, entitled "Manganese in Cast Iron" was read by the author, and was followed by a short discussion.

A paper by O. Benson, C. E., entitled "Incombustible vs. Combustible Foundry Buildings, with Special Reference to their Strength, Durability, Economy and Cost," was read by title.

New Officers and Committees.

President Schumann then announced the appointment of the following committees:

Committee on Standard System of Test Bars for Cast Iron—Dr. Richard Moldenke, chairman; Thos. D. West, James S. Stirling.

Committee on Establishment of Central Agency for Standardized Drillings—Thos. D. West, chairman; Dr. R. Moldenke, J. Scott.

J. S. Seaman, of Pittsburg, made a short address, seconding the invitation to the association to hold its next meeting at Pittsburg, and gave an outline of the places of interest the members could visit.

The annual election of officers was taken up, and resulted in the choice of the following:

President—C. S. Bell, C. S. Bell Co., Hillsboro, O.

Secretary—John A. Penton, Detroit.

Treasurer—Howard Evans, J. W. Paxson Co., Philadelphia.

The vice-presidents for the various districts are: New England, C. L. Newcomb, Deane Steam Pump Co., Holyoke, Mass.; Middle States, I. W. Frank, Frank-Kneeland Machine Co., Pittsburg; Southern States, E. H. Putnam, Southern Agricultural Works, Atlanta, Ga.; Central Western States, C. A. Bauer, Warder, Bushnell & Glessner Co., Springfield, O.; Northwestern States, C. J. Wolff, L. Wolff Mfg. Co., Chicago; Southwestern States, W. S. Mosher, Mosher Mfg. Co., Dallas, Tex; Pacific States, R. Chartrey, Joshua Hendy Machine Works, San Francisco; Canada, Joseph Best, Warden King & Son, Montreal, P. Q.

Mr. Bell was introduced to the members by Mr. Schumann, and made a short speech of acceptance and thanks for the honor conferred upon him.

A vote of thanks for his very able administration of the office of president in the past year was tendered to Mr. Schumann, who in a few words expressed his regret at retiring from active work in the association and his appreciation of the importance and value of the organization.

A vote of thanks was given to the foundrymen and those in allied interests who, as hosts, made the visit of the association to Cincinnati so enjoyable. The convention then adjourned.

NEGOTIATIONS are said to be on foot for a consolidation of hot air and hot water furnace companies. A Utica, N. Y., dispatch says that Russell Wheeler & Son, the Carton Furnace Co., and the Kernan Furnace Co. of Utica, are included, besides Syracuse, Boston and Philadelphia concerns.

NECESSITY OF WELL MIXED FURNACE CASTS AND CORRECT PIG IRON ANALYSES.*

BY THOS. D. WEST.

The recent advance in founding, causing us to realize that the grain of pig metal is not a reliable index to its grade, has opened a door to such results, through the occasional indifference and error of those using analyses in shipping iron, as may cause more contention than ever between maker and buyer and often heavy losses to both. A few years back every furnace had its "graders" whose special business it was to direct the separating of casts of iron into different piles, according to the grain of the pig metal. The most open pigs went into piles as No. 1 iron; the smaller grained as No. 2, 3, or 4, according as the grain decreased in size. The greatest care was exercised in thus grading iron, not only because all believed that the size of the grain revealed the grade but also because the grader had a reputation to sustain, in making his various piles of even grain and the furnaceman was anxious to have every pig of the open iron collected by itself, for a No. 1 iron brought him more money than a No. 2.

With the advent of selling by chemical analyses, all this was changed. The graders were replaced by the chemists and the iron as it came from a "cast" is now thrown into one pile, and neither furnaceman nor the progressive founder, as a rule, pay any attention to the size of the grain in pig metal. Yet, entire reliance upon analyses sometimes leaves the purchaser, it might be said, in the position of the man buying a "pig in a poke," because the reported analyses may belie the real composition of the iron. Because of this fact, any indifference or error on the part of the shipper, might cause grievous injury as well as losses to the trade of both furnaceman and founder, especially to founders who do not employ chemists to check up their furnace analyses.

It is not the purpose of this paper to indicate in detail how errors in reported analyses can be made. Furnacemen know this themselves. The main object is to urge the furnacemen to use every precaution to have reported analyses as nearly correct as it is possible to have them, and to have the various casts at the furnace well mixed. It should not be inferred from what is said above that all furnacemen are indifferent to their analyses reports. Some are striving earnestly to avoid mistakes in this particular. But I can say that our firm has had such losses from want of care on the part of some furnaces, in the matter of reporting analyses, that we will not wholly depend any more on furnace analyses. We now have our own chemist, who checks every car of iron that comes into our yard. Since we have adopted this measure, it is rare (providing a car or cast of iron is fairly uniform), that we vary .10 in silicon or are seriously off in the sulphur desired in our product. Before we had our own chemists, we were as liable to be .75 off in silicon or .04 in sulphur as we were to obtain the desired results, let the car of iron be ever so well mixed or unifom in grade.

I am well aware that furnacemen could reply to this paper by citing cases wherein failure to obtain desired results was due more to the ingorance of the founder, than to errors on the part of the iron shippers. This I do not deny; but there should be an end of tolerating such ignorance on the part of the founder. As buyer he should tell what he wants, as is the practice in purchasing most staple trade articles. If a founder is unable to specify for himself what class of iron he should have, or the combination of elements necessary to give him desired physical results in his castings, he should suffer his own losses, till he learns. There is no excuse at this day for his not knowing all this, at least as much as he has any right to expect of the furnaceman.

It is not just that a furnaceman should assume the responsibility for what a founder may obtain from a mixture of his iron, for the founder can readily nullify the value of analyses, (or the results to be obtained from pig metal in mixture by itself), by using scrap or by variations in fuel and methods of charging. All that should be expected of the furnaceman is a well mixed cast with a correct analysis of the iron. But to secure this, much reformatory work is yet to be done. The aim should be to discover, if possible, what factors are con-

*Read before the American Foundrymen's Association, Cincinnati, June 7-10, 1898.

stant, impractical of change, and those that are dependent on the judgment or care of the operator. There are many chances to make errors in the analysis cards of iron from the time it leaves the casting house until it reaches the cars ready for shipment. Such work may have to pass through the hands of four or more men by whose carelessness the reported analysis may be badly distorted from that found by the chemist.

My reasons for urging every founder to employ his own chemist are two-fold. In the first place, this plan better insures desired results from mixtures. In the second place, the control of operations by analysis would soon be so perfect that foundrymen unacccustomed to employing it would be compelled to recognize their progressive competitor's advantage, in securing and holding trade, and would follow his example. It is not to be expected that all founders knowing the advantage of working by analysis will advocate its general adoption. There are many to-day working by analysis who would prefer not to have its use extended. simply because they are satisfied to make the money, if their competitors are satisfied to plod along without being able to declare dividends.

In one sense blast furnacemen are not to blame if they are indifferent to exactness in analyses, for the founders utilizing chemistry are in the minority at the present day. The majority are indifferent or prejudiced against it. Then again, we have those whose self interests lie in advocating old practices and who, taking advantages of the majority's indifference, decry the adoption of analysis. Their action is inimical to the advancement of founding, as is that of the politician, who, to gain office, will cater to ignorance for the purpose of catching votes.

But granting that the furnaceman has not at present every incentive to accuracy, how are we to expect fondrymen, starting out to test the utility of analysis, to become its advocate, if his furnace report turns out to be incorrect? Is it not natural for such a founder to declare working by analysis unreliable, or not as good as judging pig iron by its fracture? All who know working by chemical analysis to be the better way, when correctly applied should labor earnestly to assist in bringing the whole foundry world to recognize its merit. When this comes about, no furnaceman will think of going out to his yard to select an open iron and mark it high in silicon, when he knows that the analysis shows it to be low. Nor would one continue shipping car after car from piles which he knew that, through mistakes in keeping track of them, the office had got so badly mixed that only by reanalysis could it be learned what each pile was. Further, the furnaceman would be careful not to allow different casts to get so badly mixed up in one pile, that when the founder received the car of iron he would find, should he check the furnace analyses, that part of it would not run much more than .50, while the other might run up to 2.00 in silicon. The writer's firm has been the victim of just such indifferent and careless work, which illustrates what trouble may come to a founder working to analyses but having no chemist to check up the furnace report, if shippers of iron are not careful and conscientious in their work.

Furnaces should recommend to all founders to use chemistry and to employ their own chemist if possible, since it will lessen contention and bring their business to a much more satisfactory basis. Before we had our own chemist, hardly a week passed without some furnaceman arranging for trouble or losses which his iron was causing. Since we have had our own chemist, we have had no occasion to interview the furnaceman (barring the question of well mixed casts), except to purchase his irons. Where is the founder having no chemist or making his mixtures by judging fracture, who can say this?

Uniform Casts of Pig Metal.

The second need that may properly be discussed in this connection is uniform casts of pig iron. These may be so irregular at times, as to make one end of a cast only suitable for making chilled castings, while the other end might be soft enough for light machinery or stove plate work, and yet all the iron might be reported under one analysis. This subject has been discussed by the writer and others in previous articles, but as it has an important bearing on the movement for greater uniformity in the analyses of pig irons, I have here extended the subject in presenting new thought and experiences, to show clearly the necessity of reform in this direction. A committee, of which I have the honor to be a member, is to bring this matter in its relations to uniform analyses, before this convention for its sanction and co-operation. Nearly every car of pig iron illustrates in a greater or less degree the evil of non-conformity in furnace casts. I have seen, for example, a car of which one sampling showed 2. in silicon, another 1.30 and a third .70. Much trouble and actual loss might result from accepting any one of these samplings as representative. Could this evil be overcome, the experienced founder, having his own chemist, might go along for months at a time, without any difficulty, obtaining to a nicety any physical qualities he had figured for his mixture providing, of course, that the founder's chemist keeps a close tab on the sulphur contained in his fuel. The point made above applies more directly to the founder having but one mixture of iron to take out of his cupola at one heat, and who from necessity must use his irons from the car or a small yard. Where founders have two or more mixtures, there is, of course, the liability of each affecting to a greater or less degree the others's qualities. But this is a question apart from that treated by this paper and is dependent upon the founder's experience and care in charging his iron. In sampling a car at the present day, no less than five pigs should be selected, and these should be chosen from equal divisions from a car or cast of iron. In cases where the best care is desirable, it is well sometimes to make two sets of analyses, taking four pigs from each end, so as to divide the car in two sections, which should be separated to make distinct piles in the yard or on the cupola staging, when the various percentages of silicon, etc., in the different piles can be figured to indicate just how much of each pile should be taken for the average desired. A very able and valuable article on "Sampling Pig Iron for Analysis," by Albert Ladd Colby, in the *Iron Age* of June 2, published after this paper was written, shows very forcibly the great need of the advancement herein advanced.

Dr. Richard Moldenke, in an interesting article in *Foundry*, of January, 1898, described a plan that may be adopted to secure a better mixed iron than by taking it direct from the car for use in the cupola. It is to have all carloads of like reported grades piled one on top of the other, and to draw from their ends to make up the charges, one analysis being made to answer for the whole pile. Drillings are taken of several pigs selected from each car and at the end all the different cars samplings are mixed thoroughly together in one sample, which is then analyzed. Two entire train-loads of iron have been successfully piled an used after this manner, with only one analysis for the whole lot. Where yard room is plenty or where one grade of mixture of iron is desired, such a system may often answer. Many founders are not situated so as to adopt this plan. They must use their iron to make several mixtures at one heat or are limited for yard room, so as to be compelled to take their metal direct from the car. The best plan for the latter class seems to be that of taking the car analysis by the sampling system herein advised. Furnacemen by furnishing well mixed casts of their iron could assist such founders, so that no matter how many samplings might be taken from a car of pig metal, no two would be found to vary materially in analysis. It strikes the writer that any furnaceman who would work to this end and prove to his customers by actual tests in sampling, that each car of his iron will run uniform, would have no difficulty in placing his iron, and in many cases at a price that would exceed that of iron furnished by those treating this subject with indifference. It is certainly worth something to the general run of founders, especially those who must use their iron direct from cars or small piles, to be assured that the one analysis of any car of iron coming to their yards will correctly represent both ends or any sction of it which might be taken for a mixture. I believe that a few furnacemen have adopted the plan of dividing their casts in two parts and analyzing each section so as to give the purchaser several analyses of the one cast of iron. Such efforts are to be encouraged. There are several methods that could be adopted, which the writer has in mind, but will not take space to outline, as any furnaceman who has an interest in furnishing well-mixed casts can, with a little study, easily devise ways of doing so. Give the experienced founder a well-mixed cast of iron and a correct report of its analysis, with a knowledge of the sulphur in his fuel, and it should be rare indeed for anything to occur to prevent his attaining to a nicety, day in and day out, the exact physical qualities desired in his casting, especially where one mixture is used throughout a heat. Unless he has these assurances, it is not just to hold a foreman or melter responsible for the result of his mixtures. Certainly our American Foundrymen's Association will have earned the gratitude of all makers and users of foundry irons if it shall take steps to secure the practical realization of the end sought to be advanced by this discussion.

APPRENTICESHIP AND GOOD MOLDERS.*

BY P. W. GATES.

The subject "The Molder of the Future and the Need of an Adequate Apprenticeship System" is one which has been given much thought. In making these remarks I do not pretend to do more than offer a few suggestions, which I hope will bring out a full discussion, and thereby give us the thoughts of members who have given this matter a great deal of study, from which it may be possible to organize an apprenticeship system which may be something like uniform throughout the States, and tend to raise up a class of molders of intelligence, calculated to meet the demands of a rapidly growing industry.

If we are to draw our conclusions of the molder of the future by comparing the molders of the present with those of the past, it becomes evident to me that steps must be taken to induce young men to embrace this trade of sufficient education to readily grasp it on different lines from those followed in the past 20 years. Otherwise the business will suffer to such an extent as to make manufacturers untold trouble. That we had better molders in the past than at present is accounted for in the fact that foundries as a rule were smaller and did a more general class of work, it often being the case that foundries employing not more than 10 or 12 molders would manufacture plows, stoves, printing presses, water wheels, steam engines, both stationary and marine, saw and grist mill machinery, reapers, mowers, threshing machines, etc. The young man who was fortunate enough to serve an apprenticeship in such a place certainly gained a general knowledge that stood him well in hand wherever he went. But the growth of this business in America has been so rapid that it has brought about the specializing of the different branches, and in doing this at once destroyed the opportunity of making the same high grade mechanics as was turned out in the general foundries. This specializing is carried to such an extent that in hiring a molder now it becomes necessary to ask him what line of work he is accustomed to; while in the past the bare statement that the applicant was a molder carried with it that he could make any class of work. I have heard it argued that specializing must continue until finally there will be shops making nothing but cylinders, others making nothing but engine frames, others nothing but fly wheels, and that it will not be necessary to have apprentices, as common laboring men can soon be schooled to make any one piece cheaper and to greater perfection. I cannot take this view, but believe the general foundry will always occupy the largest place, at least in number, and to my mind the molder of the future must be different from his prototype. He must have a good education to begin with, so as to be able to study properly the material he is using. In the future pig iron will be known by its properties; so with sand and all other material the molder uses. Hence the ignorant boy who formerly made a fairly good molder will have no place in the strictly modern foundry of the future.

Speaking now of apprentices in general, for all branches are equally affected, I think it will be conceded without much argument that the more intelligent a class of mechanics becomes, the higher the standard of the work which they produce, and the higher the moral tone and self-respect of such class. It seems to me necessary for the foundrymen and manufacturers generally throughout the country to encourage and employ apprentices, for the sake of supplying the places of journeymen who fall out of the ranks through sickness, death, etc., and to supply the necessary molders for new industries. It therefore seems desirable to me that young men of education be induced to seek this vocation as a means of livelihood.

If this is the fact, the question then arises as to how we may secure such apprentices. The experience in our works has been that it is very difficult to induce young men who have passed the grammar schools, or schools of equal or higher standard, to embark in the molder's or other trades. There seems to be no difficulty in getting plenty of applicants of an uneducated class, but our experience in the past has been that this class are not willing to submit to the necessary discipline, and if they are, they are usually dull and slow to learn. On the other hand, we have found that where we could get applicants who had been through the grammar schools, or other equally good schools, they appreciated the fact that discipline must be enforced, were always willing to live up to the rules, were anxious to advance themselves, and were students in their new vocation, as well as they must have been at school, in order to have passed through it. Having acquired the habit of study, we find that they apply the same thought to their work, can readily grasp the instructions given by the foreman, and are not satisfied with merely getting through with their work as a stint. On the other hand, they study the conditions and take great pride in the character of work which they are turning out. From this experience, we have reached the conclusion that we shall try to confine ourselves to a class of apprentices who have at least reached as high a standing as to pass the sixth grade in the public grammar schools, and, if possible, who have graduated from the grammar school or some school of equal standing with the public schools of our city.

In casting about for the reason why we do not have applicants from this class of young men for apprenticeship we reached the conclusion that the inducements offered are too small, and therefore decided to offer a better scale of wages and inducements, for several reasons. First, in many instances the parents of would-be applicants of this kind are mechanics who have had a great struggle to give their children the benefit of a grammar school education, and who, having other children coming along who are gradually absorbing more of their means, feel that as soon as the boy has passed the public school, he should be in condition to be self-supporting, and cannot therefore afford to contribute much if any toward the support of the boy for a further term of two or three years while he is passing through the earlier stages of his apprenticeship. On the other hand, it is natural, and in one sense creditable to the boy, that he should wish to be self-supporting, and also only natural that he should desire to earn enough so that he may have some small amount of spending money. These desires we think often blind the boy, and perhaps the parent as well, to the fact of the reward when the apprenticeship is done, and the possiblility that the boy may find some employment which will earn him something like $1 or even $1.50 a day at once, although it may be nearly as high an amount of wages as he will ever reach, decides him to go in this direction.

I know a number of young men who attended public school with me when a boy who are to-day in positions such as street car drivers, conductors, teamsters, etc., who I remember as bright boys in their studies. Some of them have told me that the mistake of their life was in not having learned a trade, and I feel sure some at least would have been able to have earned much more money than they are now earning, and perhaps been high in the offices of some good institution, had they learned a trade thoroughly.

I am sometimes inclined to agree with a friend who once asserted that no one ever learns anything from experience. Be that as it may, young poeple are slow to profit by the experience of others, and since the fact remains that we do not seem to get many applications from desirable apprentices, we set the foregoing reasons down as being responsible for the fact, and adopted the following standard:

We refuse to take any applicant who is not to appearances physically sound, cannot bring good recommendations as to character, has not passed through the public schools at least as far as the sixth grade, or of some equivalent educational institution, and is willing to serve three months on trial before signing articles for a four-year's apprenticeship; the three months of trial, however, being counted as so much time on the first year.

A year is to consist of 300 days of 10 hours each, and for
The first year we pay 7½ cents per hour, or $4.50 per week.
The second year we pay 10 cents per hour, or $6.00 per week.
The third year we pay 12½ cents per hour, or $7.50 per week.
The fourth year we pay 15 cents per hour, or $9.00 per week.

The weeks consist of 60 hours, and it is our policy to give the apprentices full weeks, even if the machinery is not running, by placing them at such times on work that can be done without the use of power.

This scale of wages was made with the idea that it would be nearly if not quite the equivalent that any would-be applicant would have offered if he were going out to find work

* Read at the Cincinnati meeting of the American Foundrymen's Association, June 8.

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of a general character, and would therefore be attractive to applicants. We offer a further inducement in the fact that we agree to give each apprentice at the end of his apprenticeship the sum of $100 as a bonus for faithful performance of the contract entered into between us. We are of an opinion that from an economic standpoint we might do better with journeymen at journeymen's wages, but we also believe that it is a duty which we owe to ourselves, and to the manufacturing fraternity to keep up an apprenticeship system which will develop good journeymen, and we feel that if we do this, and other manufacturers do it, we shall be able to supply ourselves in the future with mechanics of such class as will be better qualified for the work demanded of them, and in this manner be indirectly repaid for the outlay.

We require of our apprentices that they attend night drawing schools so that they may become competent to make ordinary sketches, and help them to learn how to read drawings, and it is our policy to interest ourselves in these matters to a large extent in order to encourage the boys in the greatest degree. I am pleased to say that we always find the class of apprentices of which I have been speaking not only willing, but anxious to avail themselves of such facilities, and that the foremen take great interest in such cases and are always willing to help the good work along.

Not only has our experience with apprentices who have passed the grade of public schools been satisfactory, but in instances where we have had apprentices who are graduates of the technical or training schools, we have found their progress rapid and their ability equally greater, and for this reason we place such graduates in a separate class, offering them apprenticeship positions which omit the first year's work, and starts them on the second year. We feel that we can do this for two reasons: namely, they have, through the practice received at the training schools, acquired some ability, which lessens the amount of attention they need from the foreman; second, a superior educational training and discipline incident thereto fit them to progress faster and accomplish the same results, or better, in the shorter time. The Western Foundrymen's Association adopted a form of agreement for apprentices in which some such distinction was made, but for some reason it has never been put into active operation by the members.

It seems very essential to me that the apprenticeship matter should be given careful consideration by this association if we have any regard for the molder of the future, and that it should be the duty of every manufacturer to increase his apprentices to the fullest extent consistent with circumstances. In our machine shop we employ 14 apprentices, in our millwright shop one, our pattern shop one, and in our foundry 10. And it is our policy immediately to put in a new apprentice as often as an old one drops out, for the reason that we advise all our apprentices as soon as their time is out not to remain in our shop, but to go out and get the benefit of experience from other shops, believing that sooner or later more or less of them will return to us more efficient workmen than ever.

There is one other matter which I might with propriety call to your attention in this paper: namely, the advisability of co-operating with the training schools in the conduct of their work shops. In talking with the principal of the Lewis Institute of the city of Chicago, on this matter, I asked him whether it would be of advantage to him if a committee from the different branches of manufacturing would call at the institute, say once a month, and inspect the work going on in the shops, and offer such suggestions as would seem to make the work practical and available for use in such manufactories when the students were out of school. He informed me that he should hail such an arrangement with delight, and that it would be of the greatest benefit to both the faculty and scholars. It seems to me, therefore, in such light, that it is the duty of associations to take up such matters, as committees of this kind, drafted out of members of associations, would not entail a hardship on any manufacturer, would cause regular attendance and would be of the greatest benefit to all concerned. It is possible that such matters had better be left to the local organizations throughout the country, but as most of the members of this association are members of some local organization it may not be amiss to mention the matter here.

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INDUSTRIAL SUMMARY.

New Buyers in the Market, and Some of Their Wants:—

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

A. L. Swett Iron Works, of Medina, N. Y., has been incorporated with $200,000 capital. Directors are Albert Swett, Lucinda M. Swett, A. J. Howard, F. Marion Poler and A. S. Braughton, of Medina.

The Martin-Muir Co. has been formed at Nevada City, Cal., to do a general foundry and machine business. Directors, Wm. H. Martin, David D. Muir, Joseph G. O'Neil, Elizabeth Martin and Mary Muir, all of Nevada City. Capital stock, $16,000.

The Frank M. Pierce Engineering Co., New York City, has been incorporated with a capital of $10,000. Francis M. Pierce, of 26 Cortlandt st., is a director.

A company has been organized at Kokomo, Ind., for the manufacture of horseless carriages and motocycles, known as the Haynes-Apperson Co. The capital stock is $25,000.

Articles have been filed incorporating the Dearing Water Tube Boiler Co., of Detroit, Mich., for the manufacture and sale of water tube boilers under the A. C. Dearing patents.

The capital stock is $25,800, all paid in. The incorporators are Jacob Siegel, Anson C. Dearing, Arthur McBean, Joseph Siegel and Charles W. Moses.

At the office of the Supervising Architect, Washington, D. C., sealed proposals will be opened at 2 P. M., June 30, for new boilers, repairs to heating and power plants, etc., of the U. S. Treasury building and Marine Hospital building at Washington.

New Construction:—

It is reported that the Ohio Steel Co. has awarded contracts for 7,000 h. p. boilers for the company's new blast furnace plant to the Stirling Co. The Lloyd-Booth Co., Youngstown, O., has the contract for a hoist and a metal mixer. Bids for blowing engines are about to be received.

The Wrought Iron Bridge Co., of Canton, O., has been awarded the contract for the erection of a bridge across the Mahoning River at Alliance. The lowest bid was $1,600 lower than the lowest bid received a year ago.

A new power house is under construction by the Port Chester Street Railway Co., of Port Chester, N. Y. It is 45 x 84 ft., and consists of a boiler room, engine and dynamo room. The building has brick side walls in which are built steel columns supporting steel truss roof. In the engine room is a traveling crane arranged so any part of the engines and dynamos n the floor below can be readily lifted and moved from one place to another. The power house is built in a substantial manner, and is a well designed modern station. The steel work for this building was designed and is being erected by the Berlin Iron Bridge Co., of East Berlin, Conn.

The Pittsburg Bridge Co., Pittsburg, through its New England agents, Collins & Norton, Springfield, Mass., has lately secured contracts for three bridges at Becket, Mass., two bridges at Whately, Mass., a bridge at Cheshire, Mass., and one on the new State road at Russell, Mass.

At St. Joseph, Mo., the Jamieson-Combe Iron Co. will erect a machine shop 50 x 80 feet.

The Union Pacific will build a 20 stall round house at Rawlins, Wyo. This insures also, it is reported, the building of the Fort Steele-Rawlins Union Pacific water pipe line, to cost $135,090.

Bids were opened at Lawrence, Kan., for the new Fowler machine shops at the State University, but all were in excess of the amount to be spent. More money will probably be secured.

At Rome, N. Y., F. A. Coleman and Geo. A. Clyde have leased the Bingham blacksmith shop and will fit it up as a wire-drawing plant. An engine house will be built and a 35 h. p. gasoline engine installed. Brass and copper wire will be manufactured.

At Coldwater, Mich., the Moltby Hot Air foundry is being pushed to completion. The walls will enclose a space of more than 8,000 square feet.

Prentice Bros., machine tool manufacturers, Worcester, Mass., are to build a new shop 350 x 50 feet, three stories high, in addition to boiler house, office, etc.

At Lawrence, Kan., the Consolidated Barb Wire Co. has commenced the erection of an extensive galvanizing plant.

Fires and Accidents:—

Fire in the hammer department of the Tyrone Iron Co.'s works at Tyrone, Pa., June 4, did considerable damage to the roof and to the equipment.

The Union Steam Forge of the MacPherson & Willard Co., at White Hill, N. J., was badly damaged by fire. The steam hammers were damaged and there was considerable loss on building and contents in other departments.

At Lynchburg, Va., June 2, P. C. Hubard's foundry and machine shop was destroyed by fire. Loss, $8,000.

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Fire destroyed the Morse Chain Co.'s plant and the plant of the Gregg Co., manufacturers of agricultural implements, at Trumansburg, N. Y. The loss is estimated at $60.000.

Fire in the foundry and machine shop of A. T. Green, Aberdeen, S. D., did $500 damage.

The Robert Lanyon's Son's spelter works at Iola, Kan., was nearly destroyed by fire June 10. Loss, $50,000. Several boilers and engines were ruined and one block of furnaces badly damaged.

General Industrial Notes:—

There are said to be 5,739 men at present on the pay roll of the Pennsylvania Steel Co., as against 3,933 a year ago.

The contract for the metal mixers to be built for the Ætna Standard Iron & Steel Co. of Bridgeport, O., has been let to the Riter-Conley Co., of Pittsburg. Hot metal will be taken from the blast furnaces at Mingo Junction.

It is reported that the Oliver & Snyder Steel Co., Pittsburg, has placed an order for the building of a Uehling casting machine at its Rosena Furnace, New Castle.

The Boston Elevated Railway Co., of Boston, has placed an order with the Walker Co., of Cleveland, for the construction of a direct current generator, which will be the largest ever built. It will have a valid capacity of 4,000 h. p., and will be capable of delivering over 5,000 h. p. for a few hours at a time. The machine will weigh 300,000 pounds, the armature alone weighing over 100,000 pounds. The generator armature will be placed directly upon the crank shaft of the engine.

A Chicago stock market review says: "American Steel & Wire stock has been the center of interest on the local stock exchange for the last week. Less than two weeks ago the common shares were selling around 25, with next to no demand. The close Saturday was at 43, and the stock had been as high as 44¼. The preferred shares did not advance in the same rapid way, but have shown great strength. Rumors concerning earnings are most encouraging to holders of the stock, it having been hinted that 10 per cent on the common was made during May. It is said that the stock will be listed on the New York Exchange later. At present it is only in the unlisted department of the Chicago Exchange.

The Big Stone Gap iron furnace, at Big Stone Gap, Va., has been leased to the Virginia Coal & Iron Co. It will be put in blast soon.

The Northern Pacific is in the market for 600 coal cars, 500 box cars and a number of locomotives. The Minneapolis & St. Louis will buy 200 box cars.

Repairs to Hamilton Furnace at Ironton, O., are about completed and it will soon blow in.

The Andrews & Hitchcock Iron Co. banked its No. 2 furnace at Hubbard, O., June 11.

At Galiopolis, O., the Enos Hill & Co. machine shops were sold at receiver's sale for $11,100 to H. R. Bradbury.

The plate mills and puddling departments of Singer, Nimick & Co.'s Sligo mills at Pittsburg, which have been running irregularly for some months, went on in full last week with a steady run assured.

A large addition is being built to the Baker Forge Co.'s plant in Ellwood City, Pa. It will be 60x110 feet, constructed of frame, with sheet iron siding. The present plant is in full operation and comfortably filled with orders for some time ahead.

The Chambersburg Engineering Co., of Chambersburg, Pa., has just made for the Pittsburg Locomotive Works what is said to be the largest riveting machine ever made. It weighs 80,000 lbs.

The Shelby Steel Tube Co., of Cleveland, has received orders recently from the Government for large amounts of drawn steel tubing for boiler use. The orders to date aggregate 150,000 feet. The company is also receiving orders from firms having contracts to furnish the Government with shrapnel shells.

Advices have reached merchants of New York giving an idea of the opportunities which will soon be offered to machinery, electrical and railway material manufacturers at Mariopol, Russia. As the port of Mariopol is not large enough

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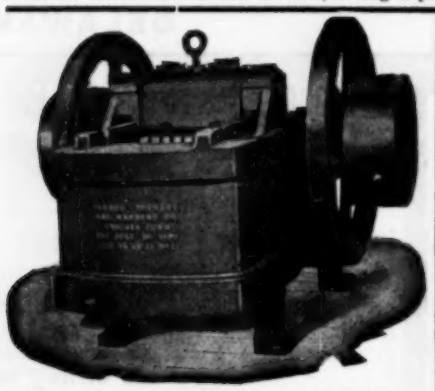

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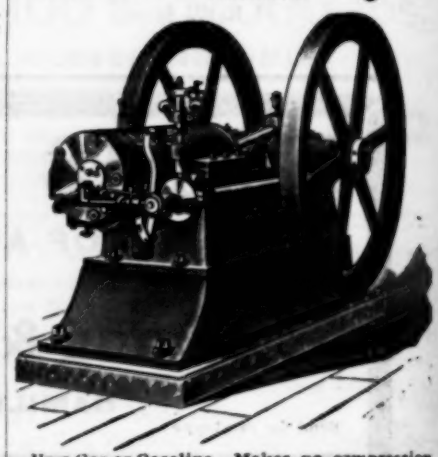

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to cope with its growing trade, the representatives of the South Russian mining and industrial interests held a meeting recently at Kharkoff and made the following representation to the Imperial Government: That the port territory be considerably increased by the construction of another basin, to the westward of the existing one, the present gates serving for both, to expand the railway system, and, in one word, bring the port into a fit state to cope with an annual trade of about 800,000 tons; but as the carrying out of the necessary measures will take at least three or four years, they propose that, in the meantime, the following should be attended to without delay: To construct a second crane for lifting heavy machinery, and several smaller ones for loading and discharging other goods; to install the electric light plant, thus enabling work to be performed both day and night; to increase the dredging operations in order to obtain a depth of 18 feet throughout the harbor. All these improvements will require a considerable outlay of capital, but it is well known that the improvements will be undertaken at an early date and the necessary machinery, etc., must be purchased abroad.

THE new 38-inch blooming mill at the Homestead Steel Works was tested Thursday, June 9, in the presence of President Schwab, Vice-President Phipps and other officials of the Carnegie Steel Co., Ltd. The mill will be put in operation at once.

Important Notice.

The C. T. & V. R. R. in connection with the C. & M. Ry. now operate two trains daily (except Sunday) between Cleveland and Canal Dover, Newcomerstown, Cambridge, Marietta, and Parkersburg. Leave Cleveland 7:15 A. M., solid through trains to Marietta without change, arriving at Marietta at 3:10 P. M. Leave Cleveland 11:00 A. M. Arrive at Marietta 7:30 P. M. For rates and further particulars call on agents or address,

J. E. Galbraith, Traffic Manager,
C. T. & V. R. R., Cleveland, O.

WHERE TO SPEND THE FOURTH.

Visit Washington and Ohio Troops in Camp—Excursion via Pennsylvania Lines.

An opportunity for a delightful Fourth of July or vacation trip and a visit to the Ohio Soldiers at Fairfax Court House, Virginia, is presented by the special low rate excursions to Washington over the Pennsylvania Lines for the National Educational Association meeting. Tickets at special reduced fare will be sold July 3d, 4th, 5th and 6th, good returning until July 15th, with privilege to extend until August 31st.

A number of persons are arranging to make the trip from this locality to see the sights at the National Capital and visit relatives and friends among the soldiers at Camp Alger, near Washington. It will be a delightful way in which to spend the Glorious Fourth. Full particulars about rates, time of trains and other details will be furnished in reply to inquiries addressed to local Ticket Agent Pennsylvania Lines, or C. L. Kimball, A. G. P. Agt., Cleveland, O.

Reduced Rates to the Pacific Coast.

The Detroit & Cleveland Navigation Co. offers exceptionally low rates to the Pacific Coast. Break your journey to the Coast with a delightful Lake ride on one of their magnificent steamers. Telephone Main 567 for particulars and rates. Ticket office foot of Superior Street.